

PROGRAM REQUIREMENTS DOCUMENT

PRD NO. 2500

DELTA LAUNCH

OPERATIONS REQUIREMENTS DOCUMENT

OR NO. 2509

IMP MISSION

10 JUNE 1972

(UNCLASSIFIED)

(NASA-CR-129268) IMP MISSION (Air Force N73-12916
Eastern Test Range) 10 Jun. 1972 117 p
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119

**U.S. DEPARTMENT OF COMMERCE
National Technical Information Service**

N73-12916

IMP MISSION

Air Force Eastern Test Range

JUN 72

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OF

N73-12916

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(PAGE TITLE) APPROVAL AUTHORITY					2. REPLACES PAGE (S)		3. PAGE NO. 1010 1	
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5. PROGRAM TITLE DELTA IMP				8. ITEM NO.		9. TEST CODE		6. PROGRAM NO. 2509
10. PRECEDENCE RATING 1-1		11. PRIORITY MUL-28T		12. INITIATION DATE		13. COMP. DATE N/A		14. SPONSORING AGENCY NASA/KSC/ULO
15. BASIC CONTRACT NO.								
16. AUTHORITY (REFERENCES) NASA/MDAC Contract NAS 7-265 (Launch Services) NASA Hq Launch Schedule								
17. NOTES								
<p>1. This document supersedes PR 2500 for the IMP mission. It includes Delta PRD inputs and is the first attempt to separate Delta missions with continuing vehicle requirements in order to change over to the Universal Documentation System (UDS), it also supersedes OR 2509.</p> <p>2. The vehicle will be modified, prepared, tested, and launched by MDAC personnel. The first stage, a modified Thor, is GFE to MDAC. The second stage is contractor furnished. The third stage rocket motor is GFE. The guidance system will be a Delta Inertial Guidance System (DIGS). The propellants will be GFE to the contractor. Facilities requirements (hangars, storage, labs, launch pad, etc.) are met under existing facilities; a Spin Test building at Pier and Cape roads; and the MARK VI Building. These requirements represent the utilization of these facilities and personnel.</p> <p>3. The NASA John F. Kennedy Space Center, Unmanned Launch Operations (ULO) has technical responsibility for Delta operations at the AFETR. Technical test control and direction will be exercised by NASA, KSC-ULO. The IMP spacecrafts will be provided by NASA.</p>								
18. APPROVAL <i>H. A. Weston, Jr.</i> H. A. Weston, Jr. Manager, Delta Operations Branch (ULO) DATE 6/20/72			19. APPROVAL <i>J. H. Williams</i> J. H. Williams NASA Test Support Office DATE			20. APPROVAL DATE		21. SUPPORT AGENCY DATE
22. APPROVAL <i>R. P. Mazurkiewicz</i> R. P. Mazurkiewicz Test Requirements and Schedules - Unmanned DATE 20 June 72			23. APPROVAL DATE			24. SUPPORT AGENCY <i>Jack W. Howe</i> Jack W. Howe, LtCol., USAF Chief, Test Operations Div. Directorate of Range Operations DATE 18 JUL 1972		25. SUPPORT AGENCY DATE

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1		MDAC Operations Attn: Glenn Speer Cx 17, CKAFS		
1		NASA, J. F. Kennedy Space Center, Florida Attn: LL-RRO-1		
1		E. W. Bonnett, Manager Delta System Division Mail STA 83-900-13 McDonald Douglas Astronautics Co. 5301 Bolsa Ave Huntington Beach, California 92647		

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1061	0	1421.4	0	2780	0	5410.4	0								
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1313.1	0	1710	0	3230.3	0	6000	0								
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			CATEGORY 1 PROGRAM INFORMATION ADMINISTRATIVE & TECHNICAL PAGE 1000 TO 1099 ADMINISTRATIVE				PROGRAM/MISSION INFORMATION (CONTINUED)				VEHICLE INSTRUMENTATION SYSTEMS
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DELTA IMP				2509							
10. USED	11. FORM NO.	12. PAGE NO.	13. TITLE	10. USED	11. FORM NO.	12. PAGE NO.	13. TITLE	10. USED	11. FORM NO.	12. PAGE NO.	13. TITLE
			<u>CATEGORY 4</u> <u>COORDINATE SYSTEMS/</u> <u>POST FLIGHT DATA</u> <u>PROCESSING AND DISPOSITION</u> <u>PAGE 4000 TO 4999</u> DATA PROCESSING/ FLIGHT EVALUATION <u>FLIGHT EVALUATION</u> - DATA COMPUTER PROCESSING SPECIFICATIONS - GENERAL R G/ 4100 - DATA COMPUTER PROCESSING SPECIFICATIONS - DETAIL R 403 4110 - DATA PROCESSING R 401 4160 DATA DELIVERY AND DISPOSITION <u>FLIGHT EVALUATION DATA</u> - DISPOSITION - GENERAL R G/ 4200 - DATA AVAILABILITY 4201 - REPORTS R 403 4205 - DISPOSITION - DETAIL R 404 4210 <u>CATEGORY 5</u> <u>BASE FACILITIES/LOGISTICS</u> <u>PAGE 5000 TO 5999</u> <u>PERSONNEL ASSIGNMENT SCHEDULES</u> - GENERAL R G/ 5100 - DETAIL R 503 5110 - HOUSING R 501 5120				TRANSPORTATION <u>TRANSPORTATION</u> - GENERAL R G/ 5200 SURFACE LOGISTICS SCHEDULE R 502 5210 AIR LOGISTICS SCHEDULE R 502 5210 SUPPLY/STORAGE/SERVICE <u>SERVICES</u> - GENERAL R 503 5330 - PROPELLANTS, GASES AND CHEMICALS R 504 5310 - AIRCRAFT AND GROUND VEHICLE FUELS R 504 5320 - MISCELLANEOUS LUBRICANTS, HYDRAULIC FLUIDS, PRESERVATIVES, ETC. R 504 5330 - VEHICLES AND GROUND HANDLING EQUIPMENT R 505 5340 - REQUESTING AGENCY AIRCRAFT R 506 5350 - SEACRAFT R 507 5360 - CHEMICAL CLEANING R 508 5370 - LOCAL PURCHASE OR BASE FUNDED ITEMS R 509 5380 LABORATORY <u>LABORATORY</u> - GENERAL R G/ 5400 CHEMICAL AND PHYSICAL ANALYSIS R 510 5410 - SPECIAL ENVIRONMENT R G/ 5420				MAINTENANCE <u>MAINTENANCE</u> - GENERAL R G/ 6300 FACILITIES <u>FACILITIES</u> - GENERAL R 611 6200 - DRAWINGS R 612 6210 - LAUNCHER AND PLATFORM CHARACTERISTICS R 613 6220 <u>CATEGORY 6</u> <u>OTHER SUPPORT</u> <u>PAGE 6000 TO 6999</u> <u>OTHER SUPPORT</u> - GENERAL R G/ 6300 TEST INSTRUMENT MAINTENANCE AND CALIBRATION R 602 6210 REQUIREMENTS FOR SUPPORT AGENCIES R 601 6020

PART 5
FORM R 105
JULY 70

1. CLASSIFICATION

(PAGE TITLE) SYSTEM SECURITY CLASSIFICATION					2. REPLACES PAGE (5) DATED _____		3. PAGE NO. 1052 12	
3. PROGRAM TITLE DELTA IMP					6. PROGRAM NO. 2509		4. DATE 10 June 1972	
7. REVISION NO.								

9. ITEM		11. SECURITY CLASS				10. ITEM		11. SECURITY CLASS			
		S	C	U	OTHER			S	C	U	OTHER
A. OVER-ALL PROGRAM						V. TARGETS					
B. PRIME CONTRACTOR						TYPE					
C. LISTS OF CONTRACTORS, ASSOCIATE CONTRACTORS AND/OR SUB-CONTRACTORS ON TEST PROGRAM						DESCRIPTION					
D. PRODUCTION, PROCUREMENT, AND SUPPLY INFORMATION						TYPE					
E. TITLE OF R & D PROGRAM						DESCRIPTION					
F. TEST VEHICLE OR MISSILE NAME						X. DRAWINGS SKETCHES PHOTOGRAPHS EXTERNAL OR INTERNAL VIEWS, AND DESIGN INFORMATION.					
G. TYPE DESIGNATION						(1) PROPULSION SYSTEMS					
H. EXTERNAL CONFIGURATION						(2) CONTROL AND GUIDANCE SYSTEM					
(1) VIEWED FROM OUTSIDE LAUNCH COMPLEX						(3) WARHEAD					
(2) VIEWED FROM INSIDE LAUNCH COMPLEX						(4) NOSE CONE					
(3) VIEWED IN ASSEMBLY BUILDING						(5) CAPSULE					
I. PHYSICAL CHARACTERISTICS						(6) TARGETS					
J. SPEED, ALTITUDE, RANGE						Y. OPERATION READINESS DATE					
K. COUNTERMEASURE INFORMATION						Z. COMBAT READINESS DATE					
L. TEST INITIATION DATE						AA. INSTRUMENTATION					
M. TEST COMPLETION DATE						BB. INSTRUMENTATION					
N. STATUS AND PROGRESS REPORT						CC. TRAINING EQUIPMENT					
O. TEST AND PERFORMANCE INFORMATION						DD. GROUND SUPPORT EQUIPMENT					
P. PROPULSION SYSTEM						EE. PAW DATA					
TYPE						FF. REDUCED DATA					
DESCRIPTION						GG. TECHNICAL PUBLICATIONS					
Q. GUIDANCE SYSTEM						HH.					
TYPE											
DESCRIPTION											
R. CONTROL SYSTEM											
TYPE											
DESCRIPTION											
S. WARHEAD											
TYPE											
DESCRIPTION											
T. NOSE CONE											
TYPE											
DESCRIPTION											
U. CAPSULE											
TYPE											
DESCRIPTION											

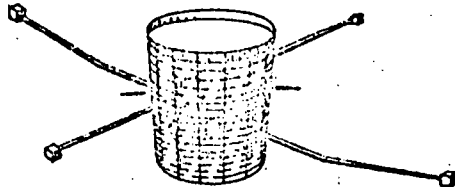
12. SECURITY GUIDES AND DOCUMENTS NASA Security Classification Guide, Rev 1, Delta Vehicle, SCG-13 January 1968		13. CONFIRMATION - OFFICE SECURITY ADVISOR R. L. Norman Medium Launch Vehicle Div.	
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1. (PAGE TITLE) SPECIAL ABBREVIATIONS AND NOMENCLATURE		2. REPLACES PAGE (S) DATED	3. PAGE NO. 1051 13 4. DATE 10 June 72 7. REVISION NO.
5. PROGRAM TITLE DELTA IMP		6. PROGRAM NO. 2509	
10. WORD OR ABBREVIATION	11. DEFINITION OR MEANING	10. WORD OR ABBREVIATION	11. DEFINITION OR MEANING
AFETR	Air Force Eastern Test Range	SECO	Second Stage Engine Cutoff
D.O.	Ditto, same as above	SRO	Superintendent, Range Operations
ESRO	European Space Research Opranization	TBD	To Be Determined
GSFC	Goddard Space Flight Center	TECO	Third Stage Engine Cutoff
IAW	In Accordance With	ULO	Unmanned Launch Operations
IIP	Instantaneous Impact Point	VECO	Vernier Engine Cutoff
IMP	Interplanetary Monitoring Platform		
JFKSC	John F. Kennedy Space Center		
MECO	Main Engine Cutoff		
NA	Not Applicable		
NRT	Near Real Time (As close to real time as is feasible, but in any case less than 10 minutes after occurence.)		
RT	Real Time (Transmission of communication with delay of electronics or electro-mechanical devices only.)		

2. REPLACES PAGE (S)					3. PAGE NO. 1001 14	
4. DATE					10 June 1972	
5. PROGRAM TITLE DELTA IMP					6. PROGRAM NO. 2509	
7. REVISION NO.						
8. ITEM NO.	9. TEST CODE	10. NAME	11. ORGANIZATION	12. TITLE AND OFFICE	13. BUSINESS ADDRESS	14. TELEPHONE NO.
1.		I. T. Gillam	NASA Hq	Program Manager	Washington, D. C.	202-755-3724
2.		W. R. Schindler	NASA-GSFC	Delta Project Manager	Goddard Space Flight Center, Greenbelt, Md.	301-982-6001
3.		J. J. Neilon	NASA-KSC	Director, Unmanned Launch Operations	CKAFS	305-853-5081
4.		H. A. Weston	NASA-KSC	Manager, Delta Operations Branch (ULO)	LL-MLV-3, CKAFS	305-853-6533
5.		J. H. Williams	NASA-KSC	Chief, NASA Test Support	TS-NTS, JFKSC	305-867-2301
6.		E. W. Bonnett	MDAC	Manager, Delta Systems Division	Santa Monica, California	714-896-5025
7.		R. J. Mazurkiewicz	NASA-KSC	Test Requirements & Scheduling-Unmanned	TS-NTS-1, JFKSC	305-867-3962

(PAGE TITLE) TECHNICAL REFERENCES		2. REPLACES PAGE (S)		3. PAGE NO. 1065	15
		DATED		4. DATE 10 June 72	
5. PROGRAM TITLE DELTA IMP		6. PROGRAM NO. 2509		7. REVISION NO.	
10. REFERENCE		11. TITLE	12. PUBLISHER AND DATE	13. SOURCE	14. SLC CL
A. ITEM	B. PAGE				
		A 243-61-01 "Printout of Antennae Pattern", Magnetic Tape No. 80-5-0059, Delta S-Band Telemetry Antennae Patterns	MDAC, April 2, 1971	On file with Data Processing and Release	U
		NASA Security Classification Guide, Revision 1, Delta Vehicle, SCG-13, dated January 1968	NASA Headquarters		U
		1B83975 Delta Inertial Guidance Flight Program Software Specification	MDAC - CKAFS	JFKSC/ULO	U
		Delta Range Safety Flight Termination Report, SM-52234C (Jan 71)	MDAC - SM	Provided to SEN and DONA	U
		IMP Preliminary Trajectory (MDAC Memo A3-250-AM00-M72-267)	GSFC/MDAC Flight Plan approval request for next series of Delta launches	Provided to DONA, March 29, 1972	U

(PAGE TITLE) MISSION / TEST OBJECTIVES		2. REPLACES PAGE (S)	3. PAGE NO. 1131 16
5. PROGRAM TITLE DELTA IMP		9. TEST CODE	4. DATE 10 June 72
		6. PROGRAM NO. 2509	7. REVISION NO.

8. ITEM NO.	10. CATEGORY	11. OBJECTIVES																																																								
		<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="text-align: center;">IMP PROJECT</p>  </div> <div style="width: 50%;"> <p style="text-align: center;">PROJECT SUMMARY</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding: 5px;">Description:</th> <th style="text-align: left; padding: 5px;"><u>IMP-I</u> *</th> <th style="text-align: left; padding: 5px;"><u>IMP-H</u></th> <th style="text-align: left; padding: 5px;"><u>IMP-J</u></th> </tr> </thead> <tbody> <tr><td>Gross Weight (lbs)</td><td>-625</td><td>-775</td><td>-825</td></tr> <tr><td>Instrument Wt (lbs)</td><td>-182</td><td>-130</td><td>-163</td></tr> <tr><td>Investigations (No.)</td><td>-12</td><td>-11</td><td>-13</td></tr> <tr><td>Exp Pwr (Watts)</td><td>-83</td><td>-83</td><td>-83</td></tr> <tr><td>Stabilization (Spin)</td><td>-$\pm 0.5^\circ$</td><td>-$\pm 1.5^\circ$</td><td>-$\pm 1.5^\circ$</td></tr> <tr><td>Design Life (Months)</td><td>-12</td><td>-12</td><td>-12</td></tr> <tr><td>Launch Vehicle</td><td>-Delta</td><td>-Delta</td><td></td></tr> <tr><td>Orbit</td><td>-Highly Eccentric</td><td>-Circular at 30 to 40 Earth Radii</td><td></td></tr> <tr><td>Contractor</td><td>-GSFC In-House</td><td>-GSFC In-House</td><td></td></tr> <tr><td>Project Manager</td><td>-P. Butler</td><td>-P. Butler</td><td></td></tr> <tr><td>Program Scientist</td><td>-E. R. Schmerling</td><td>-E. R. Schmerling</td><td></td></tr> <tr><td>Project Scientists</td><td>-F. B. McDonald</td><td>-N. F. Ness</td><td></td></tr> <tr><td>Center</td><td>-GSFC</td><td>-GSFC</td><td></td></tr> </tbody> </table> <p style="text-align: center; margin-top: 20px;">* LAUNCHED 1971</p> </div> </div>	Description:	<u>IMP-I</u> *	<u>IMP-H</u>	<u>IMP-J</u>	Gross Weight (lbs)	-625	-775	-825	Instrument Wt (lbs)	-182	-130	-163	Investigations (No.)	-12	-11	-13	Exp Pwr (Watts)	-83	-83	-83	Stabilization (Spin)	- $\pm 0.5^\circ$	- $\pm 1.5^\circ$	- $\pm 1.5^\circ$	Design Life (Months)	-12	-12	-12	Launch Vehicle	-Delta	-Delta		Orbit	-Highly Eccentric	-Circular at 30 to 40 Earth Radii		Contractor	-GSFC In-House	-GSFC In-House		Project Manager	-P. Butler	-P. Butler		Program Scientist	-E. R. Schmerling	-E. R. Schmerling		Project Scientists	-F. B. McDonald	-N. F. Ness		Center	-GSFC	-GSFC	
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Center	-GSFC	-GSFC																																																								
		<p>OBJECTIVES:</p> <p>The IMP Program consists of a series of spacecraft designed to extend our knowledge of solar-lunar-terrestrial relationships by conducting a continuing study of the radiation environment of the interplanetary medium: the interplanetary magnetic field, and its dynamical relationships with solar particles.</p>																																																								

(PAGE TITLE)

TEST PROGRAM OPERATIONS SCHEDULE

2. REPLACES PAGE (S)

3. PAGE NO.

1140

17

DATED

4. DATE

10 June 72

5. PROGRAM TITLE

DELTA IMP

6. PROGRAM NO.

2509

7. REVISION NO.

6. ITEM NO.	9. TEST CODE	10. TEST SERIES	11. RANGE HRS/ TEST	12. NUMBER OF TESTS PER QUARTER																			
				FY 72				FY 73				FY				FY				FY			
				CY 72				CY 73				CY				CY				CY			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	A	IMP-H Prelaunch Launch	24 10																				
2	A	IMP-J Prelaunch Launch	24 10																				

FORM R 116
JULY 70

1. CLASSIFICATION

1. PAGE TITLE) TEST VEHICLE DESCRIPTION DSV-3N-11A (1604)					2. REPLACES PAGE (S)	3. PAGE NO. 1300	18
					DATED	4. DATE 10 June 72	
5. PROGRAM TITLE DELTA IMP			8. ITEM NO.	9. TEST CODE	6. PROGRAM NO. 2500	7. REVISION NO.	
10. STAGE/MODULE NOMENCLATURE	A. SOLIDS	B. 1ST	C. 2ND	D. 3RD	E. TOTALS	16. REMARKS (1) Weights are total for six solids. (3) Including spin table (175) and fairing (535). (4) 50% hydrazine/50% UDMH. (5) Estimated 70 lb offload from nominal 2285 lb.	
11. PHYSICAL DIMENSIONS - FT							
A. LENGTH	19.7	85.2	17.6	5.9			
B. DIAMETER	2.6	8.0	4.6	3.1			
C. WIDTH - MAX							
12. WEIGHTS - POUNDS							
A. DRY (EMPTY - NO FUEL)	9900 (1)	9300	2423 (3)	181			
B. PROPELLANT OR FUEL	29018	55700	3572	2215 (5)			
C. OXIDIZER	-	119500	6732	-			
D. GASES	-	120	35	-			
E. MISCELLANEOUS	-		5	-			
F. DESTRUCT MATERIAL	15	100	15	-			
G. LAUNCH	59178	18 720	12732	2396			
H. BURNOUT	9806	10900	1953	165			
13. PROPULSION SYSTEM							
A. TYPE ENGINE	Solid	Liquid	Liquid	Solid			
B. MANUFACTURER	Thiokol	Rocketdyne	Aerojet	Thiokol			
C. DESIGNATION	TX-354-5	MB3-III	AJ10-118F	TE-364-4			
D. NUMBER OF ENGINES	6	1 ME, 2 VE	1	1			
E. SPECIFIC IMPULSE - ISP	237.6	252.4	303.1	285.3			
F. THRUST - POUNDS/ENG	52150	170000	9178	14900			
G. THRUST DURATION - SEC	39	265	342	43			
14. PROPELLANTS AND GASES							
A. PROPELLANT OR FUEL	-	RJ-1	(4)	-			
B. OXIDIZER	-	LOX	N ₂ O ₄	-			
C. GASES	-	GN2	GHe/GN ₂	-			
D. GAS PRESSURE - PSI	-	3000	4450/4000	-			
15. PERFORMANCE	WILL BE PROVIDED TO DR & R ON MAGNETIC TAPE WHEN AVAILABLE.						
A. RANGE							
B. ALTITUDE							
C. MAX VELOCITY							
D. MAX ACCELERATION - G							
E. TIME - T + SEC							

FORM R 117
JULY 70

1. CLASSIFICATION

(PAGE TITLE) DRAWING - MISSILE OR VEHICLE (DSV-3N-11A) - 1604			2. REPLACES PAGE (S) DATED		3. PAGE NO. 1310	
3. PROGRAM TITLE DELTA IMP			8. ITEM NO.	9. TEST CODE	6. PROGRAM NO. 2509	7. REVISION NO.

10.

DSV-3N-11A VIEW LOOKING UPRANGE
AT DOWNRANGE SIDE

LOOKING FORWARD

FORM R G/C
JULY 70

1. CLASSIFICATION

(PAGE TITLE) DRAWING - MISSILE OR VEHICLE (DSV-3N-11A)		2. REPLACES PAGE (S)	3. PAGE NO. 1312.1 20
5. PROGRAM TITLE DELTA IMP		6. ITEM NO.	7. REVISION NO.
		9. TEST CODE	4. DATE 10 June 72
		8. PROGRAM NO. 2509	

10.

<u>Identification</u>	<u>Overall Dim (inches)</u>	<u>Code</u>	<u>Angular Location</u>
#4 Solid Rocket	31 x 289	SR4	137° 9' CW from QUAD IV Looking Forward
#5 Solid Rocket	31 x 289	SR5	257° 9' CW from QUAD IV Looking Forward
#6 Solid Rocket	31 x 289	SR6	17° 9' CW from QUAD IV Looking Forward
#7 Solid Rocket	31 x 289	SR7	222° 51' CW from QUAD IV Looking Forward
#8 Solid Rocket	31 x 289	SR8	342° 51' CW from QUAD IV Looking Forward
#9 Solid Rocket	31 x 289	SR9	102° 51' CW from QUAD IV Looking Forward
Telemetry Antenna, 1st Stage	1.57 x 3.07	TM1	121° CW from QUAD IV Looking Forward
Telemetry Antenna, 1st Stage	1.57 x 3.07	TM1	301° CW from QUAD IV Looking Forward
Electrical Line Tunnel, 1st Stage	10.15 x 2 x 620	TLA	90° CW from QUAD IV Looking Forward
Electrical Line Tunnel, 1st Stage	10.15 x 2 x 620	TLB	270° CW from QUAD IV Looking Forward
Liquid Oxygen Vent, 1st Stage	5.125 Dia	LV	107° 30' CW from QUAD IV Looking Forward

1. PAGE TITLE DRAWING - MISSILE OR VEHICLE (DSV-3N-11A)			2. REPLACES PAGE (S)	3. PAGE NO. 1312.2 21
5. PROGRAM TITLE DELTA IMP			6. PROGRAM NO. 2509	4. DATE 10 June 72
8. ITEM NO.		9. TEST CODE	7. REVISION NO.	

<u>Identification</u>	<u>Overall Dim (inches)</u>	<u>Code</u>	<u>Angular Location</u>
Fuel Vent, 1st Stage	2.15 Dia	FV	324° CW from QUAD IV Looking Forward
Range Safety Antenna, 1st Stage	2.625 x 9.125	RS1	45° CW from QUAD IV Looking Forward
Range Safety Antenna, 1st Stage	2.625 x 9.125	RS1	225° CW from QUAD IV Looking Forward
C-Band Antenna, 2nd Stage	3.38 x 2.38	C	145° CW from QUAD IV Looking Forward
Telemetry Antenna, 2nd Stage	1.57 x 3.07	TM2	141° 19' CW from QUAD IV Looking Forward
Telemetry Antenna, 2nd Stage	1.57 x 3.07	TM2	321° 19' CW from QUAD IV Looking Forward
Fairing Tunnel, Fuel Lines, 2nd Stage	7.0 x 100	T2A	0° on QUAD IV Looking Forward
Fairing Tunnel, Electrical, 2nd Stage	7.0 x 110	T2B	180° CW from QUAD IV Looking Forward
Range Safety Antenna, 2nd Stage	2.625 x 9.125	RS2	70° CW from QUAD IV Looking Forward
Range Safety Antenna, 2nd Stage	2.625 x 9.125	RS2	160° CW from QUAD IV Looking Forward
Range Safety Antenna, 2nd Stage	2.625 x 9.125	RS2	250° CW from QUAD IV Looking Forward
Range Safety Antenna, 2nd Stage	2.625 x 9.125	RS2	340° CW from QUAD IV Looking Forward

FORM R G/C
JULY 70

1. CLASSIFICATION

1. CLASSIFICATION

ORDNANCE ITEMS -- DESCRIPTION

2. REPLACES PAGE(S)

3. PAGE

1313

22

4. DATE

10 June 1972

DATED

5. TEST PROGRAM CONTRACTOR

6. REVISION NO.

7. TEST PROGRAM TITLE

DELTA IMP

8. TEST PROGRAM NO.

2509

9. TEST PROGRAM AGENCY

10. ITEM NO.	11. TEST CODE	12. PURPOSE	13. TYPE	14. LOC	15. QTY	16. MANUFACTURER	17. PART NO.	18. INSTL CODE	19. EXT LEAD	20. LEAD LENGTH-METERS				21. CURR - AMPS			22. BRIDGE			23. CLASS	24. RF SAFE	25. EL	
										UNSHIELDED		SHIELDED		MAX NO FIRE	MIN FIRE	NOM FIRE	WAT	OHMS					
										Uninst	Instl	Uninst	Instl					MAX	MIN				
1		DESTRUCTOR	S&A MECH 1	1	1	W.L. MAXON	84025	PT	NO					17.3	.075	0.40	2.0	BW	0.5	0.05	1	S	P
			S&A MECH 2	1	1		(1803471-1)	PT	NO					30.0	.075	0.40	2.0	BW	9.5	5.05	1	S	P
2		DESTRUCTOR	PRIMACORDS	1	4	MDAC	1A97634-1	IT													2	S	
3		DESTRUCTOR	PRIMACORDS	1	2	MDAC	1A97635-501	IT													2	S	
4		DESTRUCTOR	PRIMACORDS	1	2	MDAC	1D13566-1	IT													2	S	
5		DESTRUCTOR	PRIMACORDS	1	4	MDAC	1D13565-1	IT													2	S	
6		DESTRUCTOR	PRIMACORDS	1	6	MDAC	1D13564-1	IT													2	S	
7		DESTRUCTOR	PRIMACORDS	1	6	MDAC	1606726-1	IT													2	S	
8		DESTRUCTOR	SHAPED CHG	1	6	THIOKOL	814-0001	PT													7	S	
9		1ST STG SP MTR IGNITER	IGNITERS	1	6	THIOKOL	TX463-2 R43552	IT													2	S	
10		PROPULSION	SP MOTORS	1	6	THIOKOL	TX364-5	PT													2	S	
11		1ST STG SP MTR IGNITER IGN	SQUIBS	1	12	THIOKOL	CR 38682	PT	NO		0.5		19.8	0.3	1.0	2.5 (1.25/0W)	BW	2.5	2.3	1	S		
12		1ST STG SP MOTOR RELEASE	BOLTS	1	6	AEROJET-GENERAL	AGX 0929 (1A59557-1)	PT	NO		0.3		16.3	0.2	1.25	2.0	9W	1.40	0.9	3	S		
13		GG IGNITION	SQUIBS	1	2	ROCKETDYNE	650717	PT	NO					0.4	2.0	4.0	BW	.85	.45	1	S		

26. RANGE SAFETY COORDINATION

CLASSIFICATION

ORDNANCE ITEMS - DESCRIPTION

2. REPLACES PAGE (U)

3. PAGE

1313.1

23

4. DATE

10 June 1972

DATED

5. TEST PROGRAM TITLE

DELTA IMP

6. TEST PROGRAM NO.

2500

7. TEST PROGRAM AGENCY

8. TEST PROGRAM CONTRACTOR

9. REVISION NO.

10. ITEM NO.	11. TEST CODE	12. PURPOSE	13. TYPE	14. LOC	15. QTY	16. MANUFACTURER	17. PART NO.	18. INSTR CODE	19. EXT LEAD	20. LEAD LENGTH - METERS				21. CURN - AMPS			22. BRIDGE			23. CLASS	24. RF SAFE	25. RE
										UNSHIELDED		SHIELDED		MAX NO FIRE	MIN FIRE	NORM FIRE	MAT	OHMS				
										Uninst	Instl	Uninst	Instl					MAX	MIN			
14		SEP 1-2 STAGE BOLT	BOLTS	1-2	3	HISHEAR CORP	SD1000 (1D01283-1)	PT	NO		0.3 0.7		15.0 13.0	1.0	3.5	5.0	BW	1.2	1.0	1	S	
15		UMBILICAL DISC	CARTRIDGES	2	5	HOLEX	6010 (1B14386-1)	PT						1.0	3.5	4.5	BW	1.2	1.0	1	S	
16		DESTRUCTOR	S&A MECH 1	2	1	W.L. MAXSON	84025	PT	NO		0.3		2.1	0.75	0.40	2.0	BW	9.10	5.95	1	S	A
			SSA MECH 2	2	1		(1B08471-1)	PT	NO		0.3		2.1	0.75	0.40	2.0	BW	9.50	5.80	1	S	A
17		DESTRUCTOR	PRIMACORD	2	1	MDAC	1B12630-501	PT												2	S	
18		DESTRUCTOR	PRIMACORD	2	1	MDAC	1B13306-501	IT												2	S	
19		DESTRUCTOR	SHAPED CHG	2	1	AEROJET-GENERAL	AGX 3900 (1B12485-1)	IT												2	S	
20		RETRO VALVE	CARTRIDGES	2	2	AEROJET-GENERAL	097487-1	PT	NO		0.4		7.9	1.0	3.0	4.0	BW	1.1	0.9	1	S	
21		SEP 2-3 STG	BOLTS	2-3	2	AEROJET-GENERAL	AGX-0959 (1B12153-1)	PT	NO		0.3		6.1	0.2	1.25	2.0	BW	1.4	0.9	3	S	
22		SEP FAIRING	CARTRIDGES	3	12	McCORMICK-SELPH	808232-1 1B11468-501	PT	NO		0.8		9.4	0.5	1.0	2.0	BW	0.6	0.4	3	S	
23		SEP SPACECRAFT	CUTTERS	3	2	HISHEAR CORP	SL1034A (1B20802-1)	IT	NO		0.8		0.56	0.1	0.7	1.0	BW	3.3	2.1	2	S	II
24		YO RELEASE	CUTTERS	3	2	HISHEAR CORP	SL1022A (1B20401-1)	IT	NO		0.15		0.85	0.1	0.7	1.0	BW	3.3	2.1	2	S	II
25		(NOT USED)																				

26. RANGE SAFETY COORDINATION

FORM R 118

JULY 70

CLASSIFICATION

1. CLASSIFICATION

ORDNANCE ITEMS -- DESCRIPTION

2. REPLACES PAGE (a)

3. PAGE

1313.2

24

DATED

4. DATE

10 June 1972

5. TEST PROGRAM TITLE

DELTA IMP

6. TEST PROGRAM NO.

2509

7. TEST PROGRAM AGENCY

8. TEST PROGRAM CONTRACTOR

9. REVISION NO.

10. ITEM NO.	11. TEST CODE	12. PURPOSE	13. TYPE	14. LOC	15. QTY	16. MANUFACTURER	17. PART NO.	18. INSTL CODE	19. EXT LEAD	20. LEAD LENGTH-METERS				21. CURR - AMPS			22. BRIDGE			23. CLASS	24. RF SAFE	25. REMARKS
										UNSHIELDED		SHIELDED		MAX NO FIRE	MIN FIRE	NORM FIRE	WAT	OHMS				
										Unlnt	Instl	Unlnt	Instl					MAX	MIN			
26		PROPULSION	SP MOTOR	3	1	THIOKOL	TE-364-4 E22E02	IT	NO											2	S	
27		IGNITER INIT	SQUIBS	3	2	McCORMICK-SELPH	809015 S-470-P-1	PT	NO		0.3		7.1	1.60	3.10	4.0	3W	1.2	1.0	1	S	
28		(NOT USED)																				
29		IGNITER 3RD STG	IGNITER	3	1	THIOKOL	E22465	IT	NO											2	S	
30		IGNITION WIRE CUTTER	CUTTER	3	2	HOLEX	6007 (1B20405-1)	IT	NO		0.9		6.0	1.0	3.5	4.0	3W	1.2	1.0	1	S	
31		DESTRUCTOR	PRIMACORD & SHAPED CHG	3	2	MDAC	1A95108-1	IT	NO											7	S	
32		3RD STAGE SPIN MOTOR	ROCKET SP (0.3 KS 40)	3	8	ATLANTIC RESEARCH CORP	P-04-80-38 7/7 (1B08287-1)	PT	YES		0.23		5.8	0.25	0.50	1.0	3W	3.7	2.4	7	S	
33		3RD STAGE SPIN MOTOR	ROCKET SP (0.6 KS 40)	3	8	ATLANTIC RESEARCH CORP	P-04-80-38-1 (1B08083-1)	PT	YES		0.23		5.8	0.25	0.50	1.0	3W	3.7	2.4	7	S	
34		3RD STAGE SPIN MOTOR	ROCKET SP (1 KS 40)	3	8	ATLANTIC RESEARCH CORP	P-04-80-38-1 6/7 (1B07972-1)	PT	YES		0.23		5.8	0.25	0.50	1.0	3W	3.7	2.4	7	S	
35		3RD STAGE SPIN MOTOR	ROCKET SP (1 KS 75)	3	8	ATLANTIC RESEARCH CORP	A0029006-001 (1D08825-1)	PT	YES		0.23		5.8	0.25	0.50	1.0	3W	1.4	0.7	7	S	

26. RANGE SAFETY COORDINATION

(PAGE TITLE) ORDNANCE ITEMS - DESCRIPTION			2. REPLACES PAGE (S)		3. PAGE NO. 1313.3	
			DATED		4. DATE 10 June 1972	
5. PROGRAM TITLE DELTA IMP		8. ITEM NO.	9. TEST CODE	6. PROGRAM NO. 2509		7. REVISION NO.
10. SKETCHES, DIAGRAMS, ETC.						
<p>NOTE A: S&A Mech has two M36A1 detonators in parallel. Values for minimum all-fire, maximum no-fire currents and resistance are based on the parallel circuit with integral filter. The electrical characteristics of each individual M36A1 detonator are: B/wire resistance (6-12 ohms), maximum no-fire (0.050 amp), and minimum fire (0.200 amp).</p> <p>NOTE B: Column 17 part numbers shown in parentheses are MDAC procurement drawing numbers.</p> <p>NOTE C: Column 21, "Norm Fire", will be considered as the current recommended by the vendor, above the minimum fire, at which the device will function reliably within the design specified functioning time. Information quoted is as available from vendor data sheets.</p> <p>NOTE D: A maximum of eight rockets will be used for payload spin stabilization on a specific mission. Items 32, 33, 34, and 35 will be used separately or in certain even numbered combinations.</p> <p>NOTE E: Maximum safe no-fire and minimum fire values of 1.0 and 3.1 amps, respectively, are the results of Bruneton Test Data.</p> <p>NOTE F: Store TE-364 motor at 40-100°F in shipping container pressurized to 5.0 ±1.0 psig with dehydrated air or GN₂. Check pressure at 3-month maximum intervals. If pressure is below 2.0 psig, notify MDAC Propulsion Engineering; otherwise repressurize.</p> <p>NOTE G: Spin rocket storage area will have a temperature recorder. Temperature limits are 20°-130°F for 1D08826-1 and 40°-110°F for all others. If temperature limits are exceeded, notify MDAC Propulsion Engineering.</p> <p>NOTE H: Hazard classification (Column 23) applies to cartridge only. When handled as an assembly, hazard classification is Class 1.</p>						

1. CLASSIFICATION

1. (PAGE TITLE) IMP S/C ORDNANCE						2. REPLACES PAGE (S) DATED			3. PAGE NO. 1313.1			26	
5. PROGRAM TITLE DELTA IMP						6. PROGRAM NO. 2509			4. DATE 10 June 1972				
7. REVISION NO.													

8. ITEM NO.	9. TEST CODE	10. PURPOSE	11. TYPE/ QTY	12. STAGE	13. MFG. PART NO.	14. INST	15. LDS	16. LEAD- LGTH-METERS			17. CURRENT-AMPS			18. BRIDGE		19. CLASS	20. RF	
								A. SHLD	B. LDS	C. INSTL	A. MAX NO FIRE	B. MIN FIRE	C. NORM FIRE	A. MAT	B. MAT			
1	-	Initiate line cutters	4	S/C	Hi-shear PC-15	N/A	N/A	N/A	N/A			1a	3.5a	5a	-	1.1	*Cat. B	ye
2	-	Release LAP door	1	S/C	Holex 2800	N/A	N/A	None	.22			.5a	1.5a	5a	-	1.6	*Cat. B	ye
3	-	Initiate Pyrogens	2	K/M	Holex 4497	N/A	N/A											
4	-	Initiate Kickmotor	2	K/M	Thiokol TE-M-521	N/A	N/A	N/A	N/A						-	-	Cat. A	ye

21. REMARKS

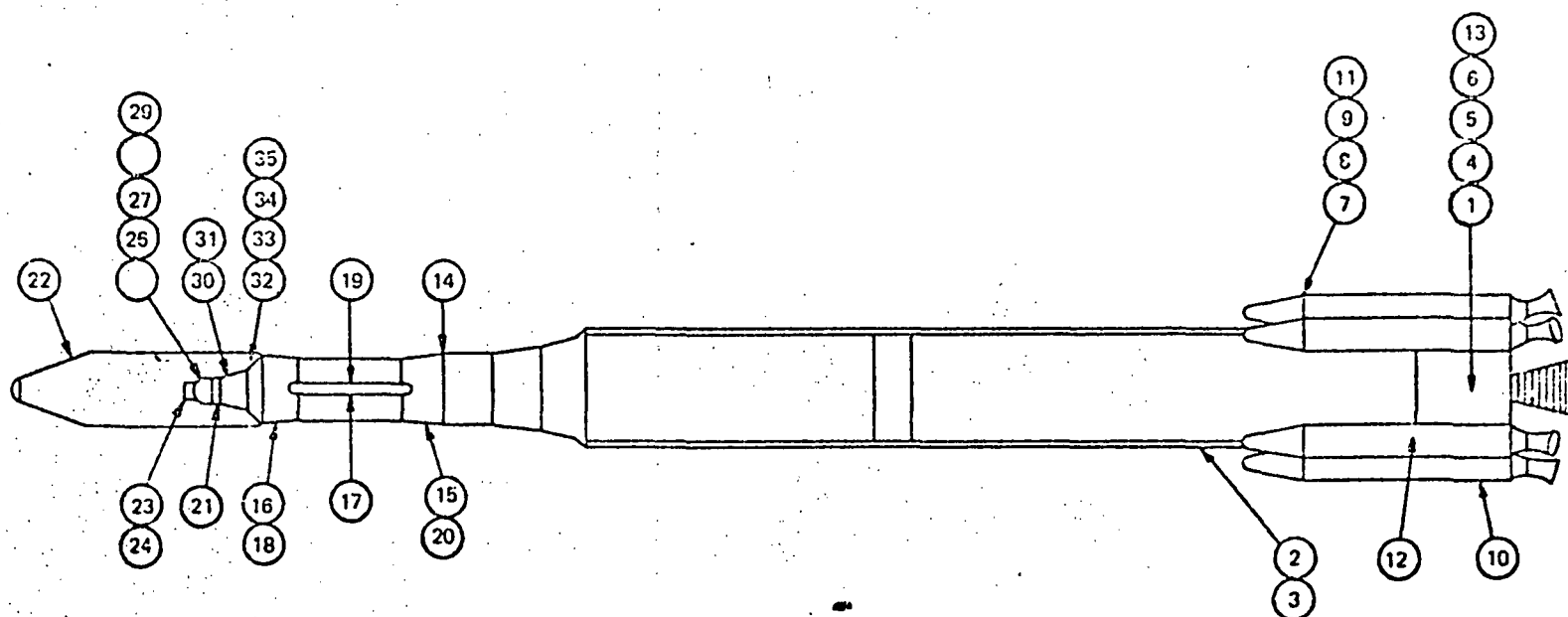
1. K/M = Kickmotor
2. *Cat. B - Cat. A in hand held mode.

FORM R 119
JULY 70

1. CLASSIFICATION

1. CLASSIFICATION _____

(PAGE TITLE) ORDNANCE DRAWING (LONG TANK DELTA, DSV-3N)			2. REPLACES PAGE (S)	3. PAGE NO. 1314 27
			DATED	4. DATE 10 June 1972
5. PROGRAM TITLE DELTA IMP	8. ITEM NO.	9. TEST CODE	6. PROGRAM NO. 2509	7. REVISION NO.



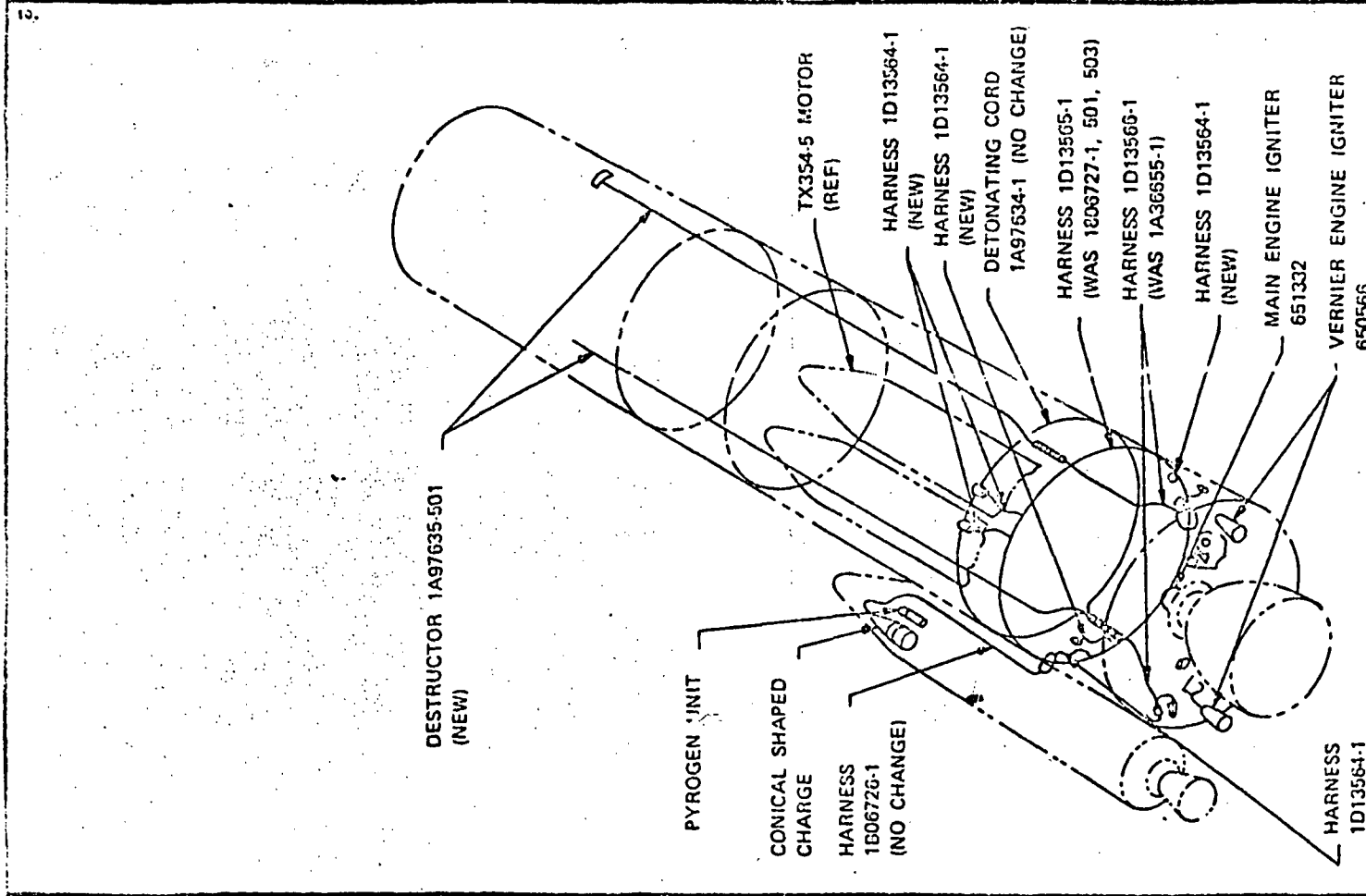
NOTE: NUMBERS IN CIRCLES ARE ITEM NUMBERS FROM 1313 PAGES.

FORM R G/C
JULY 70

1. CLASSIFICATION _____

1. CLASSIFICATION

(PAGE TITLE) ORDNANCE DRAWING - LAUNCH VEHICLE			2. REPLACES PAGE (S)	3. PAGE NO. 1314.1 28
5. PROGRAM TITLE DELTA IMP			6. PROGRAM NO. 2509	4. DATE 10 June 1972
8. ITEM NO.	9. TEST CODE	7. REVISION NO.		



FORM R G/C
JULY 70

1. CLASSIFICATION

1. (PAGE TITLE) SPACECRAFT CHARACTERISTICS			2. REPLACES PAGE (S) DATED	3. PAGE NO. 1321 29
5. PROGRAM TITLE DELTA IMP	6. ITEM NO.	9. TEST CODE	6. PROGRAM NO. 2509	4. DATE 10 June 72
			7. REVISION NO.	

10.

SPACECRAFT GEOMETRY

The geometric structure of the IMP-H spacecraft, as shown on page 1322, is a 16-sided drum measuring 53.4 inches across the flats and 62 inches in overall height. The spacecraft consists of an aluminum honeycomb shelf which is supported by eight struts and an 18-inch diameter thrust tube on the underside. The experiments and instrument modules are mounted on the topside of the shelf, and a solid propellant kick motor for orbit circularization is centrally located in the upper part of the structure. The instrumentation midsection is fully inclosed by metallic covers and side panels to satisfy stringent RF shielding and thermal requirements, while two bands of solar panels above the midsection and one below it supply electrical power to experiments and electronic when in orbit. Four active and four passive turnstile-type RF antennas, equally spaced, extend radially from a spacer between the two upper solar panel bands. Two 10-foot experiment booms and two 5-foot ACS booms are folded alongside the structure during launch and transfer phases, and then deployed to their extended positions by ground command after final orbit is achieved.

STABILIZATION**ORIENTATION SENSOR SYSTEM**

The optical aspect system, consisting of sun and earth sensors and associated electronics, provides spin axis orientation data, spin rate data, and onboard sun orientation pulses.

ATTITUDE CONTROL SYSTEM

The attitude control system is a cold gas monopropellant system using Feron 14. It will be actuated by ground command to align the kick motor for a near circular orbit, orient spacecraft spin axis normal to the ecliptic plane, and adjust spin rate.

SPIN RATES

- (1) During third stage burning: 40 to 50 rpm
- (2) Prior to boom deployment: 20 rpm
- (3) During normal operations: 46 rpm, adjusted by ACS command.

1. CLASSIFICATION _____

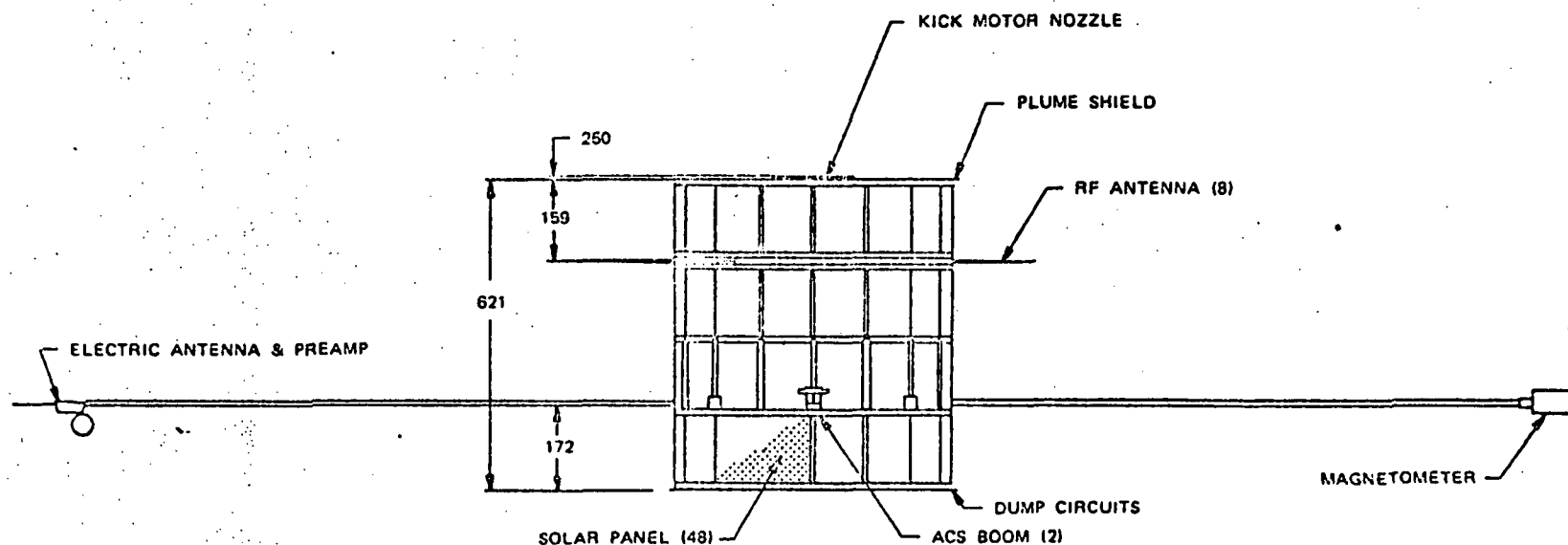
1. (PAGE TITLE) SPACECRAFT TELECOMMUNICATIONS		2. REPLACES PAGE (S) DATED		3. PAGE NO. 1321.1 30	
5. PROGRAM TITLE DELTA IMP		6. ITEM NO.	9. TEST CODE	6. PROGRAM NO. 2503	7. REVISION NO.
10. PARAMETER	SPACECRAFT TO EARTH		EARTH TO SPACECRAFT		
NUMBER OF LINKS	2		2		
FREQUENCY BAND TO BE USED	135 - 138 MHz		148.980 MHz		
11. NUMBER OF SPACECRAFT ONE					
12. BRIEF SYSTEM DESCRIPTION OF SPACECRAFT TELECOMMUNICATIONS SYSTEM					
<p>(1) Spacecraft to earth, 136.890 MHz, 8 watts, phase modulated.</p> <p>This transmitter will be used for R&RR data and special purpose split-phase PCM data (300 and 3200 bps, convolutional coding) from the Data System Engineering Test. This transmitter will be used for main telemetry data during launch and may be used during the first perigee shadow or if the 12-watt transmitter fails. If the DST is not available at launch, the Delta instrumentation package will provide analog data via two IRIG subcarriers (Channels 8 and 10). The analog telemetry data would be FM/FM/PM modulated ± 1 radian.</p> <p>(2) The primary spacecraft to earth link will be 137.920 MHz, 12 watts, phase modulated.</p> <p>This transmitter will be used for 800 or 3200 bps, split-phase PCM, convolutional coding, 1/2 rate code (i.e., only 1/2 bit rate is information; other half is parity). In the event the convolutional encoder fails, a complementary code will be used consisting of 4 bits data followed sequentially by 4 bits of the same data inverted. This transmitter will be off at launch and will be turned on by ground command within one hour after separation.</p> <p>(3) Earth to spacecraft, 148.980 MHz. Standard GSFC sequential tone. Spacecraft Receiver No. 2.</p> <p>(4) Earth to spacecraft, 148.980 MHz. Standard GSFC PCM/FSK. Spacecraft Receiver No. 1.</p> <p>(5) Earth to spacecraft, 148.980 MHz. Standard GSFC R&RR. Spacecraft Receiver No. 1.</p>					

FORM R G/C
JULY 70

1. CLASSIFICATION _____

(PAGE TITLE) IMP-H SPACECRAFT OUTLINE DRAWING		2. REPLACES PAGE (S)	3. PAGE NO. 1322 31
		DATED	4. DATE 10 June 72
5. PROGRAM TITLE DELTA IMP	8. ITEM NO.	9. TEST CODE A9	6. PROGRAM NO. 2509
		7. REVISION NO.	

10.

IMP-H GENERAL LAYOUT (SIDE VIEW)

IMP-H and J Spacecraft — The IMP spacecraft structure has improvements and modifications which are based on advances in the state-of-the-art and new spacecraft requirements. Geometrically the structure is a 16-sided drum measuring 53.4 inches across and 62 inches high. The structure consists of an aluminum honeycomb shell supported by eight struts and an 18-inch diameter thrust tube on the underside. Experiment modules are mounted on the topside of the shell. To satisfy the stringent RF and thermal requirements, the experiment section is fully enclosed by metallic cover and side panels. Three solar array rings are used to supply power to the experiments and electronics when in orbit. Appended to the exterior of the structure are two experiment booms and two attitude control system booms. These booms fold alongside the spacecraft and deploy at a preselected time and sequence. The IMP-J spacecraft includes four 150-foot experiment antennas which are deployed after orbit has been achieved. A "kick" motor is employed to set the final orbit of the spacecraft.

1. CLASSIFICATION

(PAGE TITLE)		2. REPLACES PAGE (S)		3. PAGE NO.	
IMP-H SPACECRAFT OUTLINE DRAWING				1322.1	
5. PROGRAM TITLE		6. PROGRAM NO.		4. DATE	
DELTA-IMP		2509		10 June 72	
7. REVISION NO.					

8. ITEM NO.	9. TEST CODE	10.
		<p style="text-align: center;">IMP-H General Layout (Top View)</p>

FORM R G/A
JULY 70

1. CLASSIFICATION

(PAGE TITLE) SPACECRAFT TELECOMMUNICATIONS			2. REPLACES PAGE (S) DATED	3. PAGE NO. 1322.2	33
5. PROGRAM TITLE DELTA IMP	8. ITEM NO.	9. TEST CODE	6. PROGRAM NO. 2509	4. DATE 10 June 72	7. REVISION NO.

10.

PCM PRIME TELEMETRY DATA FORMAT

Explanation of IMP-H Telemetry Nomenclature

Code = PCM, split phase
 Primary Mode = convolutional encoding (4 bits data, 4 bits coded data)
 Backup Mode = 4 bits data followed sequentially by 4 bits of the same data inverted
 Word Length = 8 bits (4 bits data, 4 bits parity)
 Channel = 16 bits (2 words)
 Sync Pattern (32 bits) = 11111010 11110011
 00110100 00000000
 Minor Frame = 16 channels - 32 words - 256 bits
 1 Sequence = 16 minor frames
 Major Frame = 256 minor frames = 1 page
 4 Sequences = 1 snap shot
 4 Snap Shots = 1 page = 81.92 sec at 800 bps
 = 20.48 sec at 3200 bps
 = 1 major frame
 4 Pages = 1 album
 Bit Rate = 800 bps or 3200 bps

There are 48 Analog Performance Parameters which are distributed throughout each "Page" (i.e., 16 sequences).

There are 56 Digital Performance Parameters which are distributed in sequences.

1. CLASSIFICATION

(PAGE TITLE)

FREQUENCY UTILIZATION SUMMARY

2. REPLACES PAGE (S)

3. PAGE NO.

1405

34

DATED

4. DATE

10 June 72

5. PROGRAM TITLE

DELTA IMP

6. PROGRAM NO.

2509

7. REVISION NO.

8. ITEM NO.	9. TEST CODE	10. FREQUENCY		11. EMISSION CHARACT	12. PURPOSE	13. GUARD BAND ±	14. TIME	15. LOCATION	16. REMARKS
		A. XMITTED	B. REC						
1	A	2244.5	-	500-F9	1st stage TLM	.3 MHz		1st stage	RFA 2-19A, Expires 12/31/76
2	A	2241.5	-	500-F9	2nd stage TLM	.3MHz		2nd stage	D.O.
3	A	256.2		FM/FM	3rd stage TLM	.500 kHz		3rd stage	RFA 1-49, Expires 12/31/74
4	A	-	416.5		Command Receiver	.2MHz		1st/2nd stage	
5	A	136.89			IMP-H S/C TLM				
6	A	137.92			IMP-H S/C TLM				
7	A		148.98		IMP-H S/C CMD				
6a	A	136.80			IMP-J S/C TLM				
7a	A	137.98			IMP-J S/C TLM				
8a	A		148.0		IMP-J S/C TLM				

FORM R 120
JULY 70

1. CLASSIFICATION

TRANSPONDERS AND BEACONS

1. REPLACES PAGE (2)

2. PAGE

1-11

35

3. DATE

10 June 72

DATED

4. TEST PROGRAM TITLE

DELTA IMP

5. TEST PROGRAM NO.

2509

6. TEST PROGRAM AGENCY

7. TEST PROGRAM CONTRACTOR

8. REVISION NO.

9. GENERAL INFORMATION

A. TEST CODE: A

B. PURPOSE:

☒ RANGE SAFETY-IMPACT PREDICTION

☐ MIDCOURSE TRAJECTORY DATA

☐ TERMINAL TRAJECTORY DATA

☐ TELEMETRY

☐

☐

C. LOCATION: Second

STAGE

D. TYPE: ☒ TRANSPONDER ☐ BEACON

E. MODEL: SST-171C

F. MANUFACTURER: Motorola

G. INTERROGATION PULSE CODE

CAPABILITIES:

☐ SINGLE PULSE ☐ DOUBLE PULSES

DOUBLE PULSE SPACING

3,4,5 : 0.1

US

6,7,8,9 : 0.1

US

10,11,12 : 0.1

US

☐ TRIPLE PULSES

PULSE SPACINGS

FIRST AND SECOND PULSES

1

US

2

US

3

US

SECOND AND THIRD PULSES

2

US

3

US

4

US

H. COMMAND CONTROL CODE

CAPABILITIES: None

NUMBER OF COMMAND CHANNELS

AVAILABLE:

TYPE OF PULSE MODULATION

POWER RMT 29+3 VOLTS, 32 WATTS

10. TRANSMITTER CHARACTERISTICS

A. FREQUENCY RANGE: 5400-5900

MC

B. ☒ TUNABLE ☐ FIXED TUNED

C. BANDWIDTH AT 3DB: 6 MHz @ 6 db

MC

D. BANDWIDTH AT 60DB:

MC

E. EMISSION: ☐ AM, ☐ FM, ☒ PULSE,

☐ COMPOSITE NONSTANDARD

F. FREQUENCY STABILITY: 1 .05

MC/C*

G. FREQUENCY STABILITY: % C.F.

H. AVERAGE POWER: 28 mw @ 142 pps WATTS

I. PEAK PULSE POWER: 400 min

WATTS

J. MAXIMUM PRF: 2600

PPS

K. PULSE WIDTHS: 0.5 us, us,

US

AT 3DB POINTS

L. FIXED DELAY SETTINGS: 2.0 us,

US

M. MAXIMUM DELAY VARIATION WITH SIGNAL

STRENGTH FROM 10DB TO WITHIN 5 DBM OF MAXI-

MUM SENSITIVITY OF RECEIVER: 0.05

US

N. RECOVERY TIME: 50

US

O. DOES THIS BEACON HAVE A RECOVERY TIME

INTERROGATION LOCK-OUT?

☐ YES ☐ NO

P. MINIMUM FREQUENCY SEPARATION REQUIRED

BETWEEN TRANSMITTER AND RECEIVER:

50

MC

Q. NOMINAL WARMUP TIME: 5

MINUTES

R. A SPECTRUM ANALYSIS REPORT ON THIS

TRANSMITTER: None available

☐ HAS BEEN PROVIDED (Date)

☐ WILL BE AVAILABLE (Date)

NOTE: Transmitting systems which require extensive periods of RF checkout time will be required to be equipped with a closed loop or non-radiating checkout device.

11. RECEIVER CHARACTERISTICS

A. FREQUENCY RANGE: 5400-5900

MC

B. ☒ TUNABLE ☐ FIXED TUNED

C. INTERMEDIATE FREQUENCY: 60 MHz

D. LOCAL OSCILLATOR FREQUENCY ☐ ABOVE,

☒ BELOW INTERROGATION FREQUENCY

E. METHOD OF FREQUENCY CONTROL:

Transistor Oscillator

F. FREQUENCY STABILITY: 1 2

MC

G. FREQUENCY STABILITY: % C.F.

H. MAXIMUM: -74 DBM AT 5690

MC

MINIMUM: -70 DBM AT 5690

MC

NOMINAL: -72 DBM AT 5690

MC

I. SELECTIVITY: (Overall)

3DB 8 to 14

MC

20DB

MC

60DB

MC

J. TYPE AGC: None

K. AGC TIME CONST:

US

L. RECOVERY TIME TO 3DB POINT:

US

M. NOMINAL WARM-UP TIME: 5

MINUTES

N. A SPECTRUM ANALYSIS REPORT ON THIS

RECEIVER:

☐ HAS BEEN PROVIDED (Date)

☐ WILL BE AVAILABLE (Date)

12. ANTENNA CHARACTERISTICS

A. LOCATION: STA. 736.009* 150

1A2

STA. -70.375** 150

1A2

STA. 1A2

STA. 1A2

WITH REFERENCE TO TRUE NORTH AFTER THE VEHICLE IS ERECTED ON THE LAUNCH PAD.

B. TYPE: Slot - Dipole

C. MODEL: 1B12353-1

D. MANUFACTURER: McDonnell Douglas

E. FREQUENCY RANGE: 5400-5900

1A2

F. ☐ TUNABLE ☒ FIXED TUNED

G. PREDOMINANT POLARIZATION: (Check only one)

☐ VERTICAL

☐ HORIZONTAL

☒ CIRCULAR: SENSE: ☒ LH ☐ RH

☐ OTHER

H. MAXIMUM GAIN IN DB WITH RESPECT TO

ISOTROPIC: +6

DB

I. MAXIMUM NULL IN DB WITH RESPECT TO

ISOTROPIC: -15

DB

(Within 60° for Antenna, 120° for radar, of longitudinal axis of main lobe).

J. MAIN LOBE BEAMWIDTH IN DEGREES AT 3DB POINTS:

ELEVATION: 70, AZIMUTH 130

K. INDICATE AVAILABILITY DATE OF ANTENNA PATTERN

MEASUREMENTS PER AFSCN 80-4. See Note

L. A SPECTRUM RESPONSE REPORT ON THIS ANTENNA:

☐ IS AVAILABLE (If available, provide five copies)

☒ IS NOT AVAILABLE

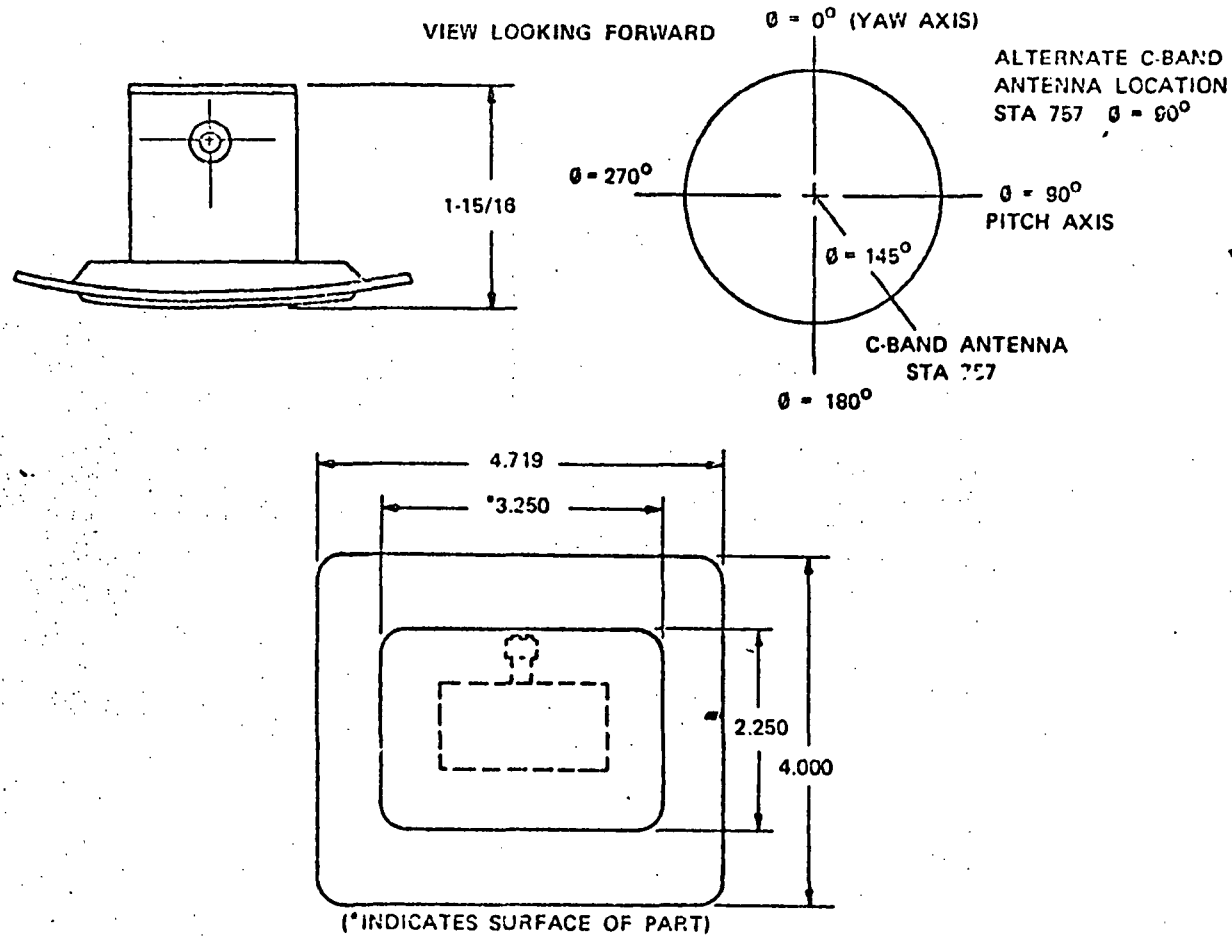
M. DB LOSS FROM TRANSMITTER TO ANTENNA INPUT:

Note: Magnetic tape transmitted by NTSD to DRR dated Feb 14, 1969, Reel No. 13508

1. CLASSIFICATION _____

(PAGE TITLE) TRANSPONDERS AND BEACONS (C-BAND)			2. REPLACES PAGE (S) DATED _____	3. PAGE NO. 1412 36
5. PROGRAM TITLE DELTA IMP	8. ITEM NO.	9. TEST CODE	6. PROGRAM NO. 2509	7. REVISION NO.

13.



FORM R G/C
JULY 70

1. CLASSIFICATION _____

(PAGE TITLE) VEHICLE TELEMETRY SYSTEMS - CHARACTERISTICS		2. REPLACES PAGE (S)		3. PAGE NO. 1421			
		DATED		4. DATE 10 June 1972			
5. PROGRAM TITLE DELTA - IMP		8. ITEM NO.	9. TEST CODE	6. PROGRAM NO.			
				7. REVISION NO.			
10. GENERAL INFORMATION		11. TRANSMITTER CHARACTERISTICS		12A. ANTENNA SYSTEM CHARACTERISTICS			
A. RF FREQUENCY 2244.5 MHZ B. BANDWIDTH AT 3DB Unk MHZ C. BANDWIDTH AT 60DB Unk MHZ D. DEVIATION 172-218 KHZ E. TYPE MODULATION PDM/FM/FM		A. LOCATION First Stage B. TYPE C. MODEL TR-2302 D. MANUFACTURER Teledyne E. LINK FREQUENCY 2244.5 MHZ F. TYPE OF MODULATION PDM/FM/FM G. BANDWIDTH AT 3DB MHZ H. BANDWIDTH AT 60DB MHZ I. IS THE ASSIGNED FREQUENCY MEASURABLE IN THE MODULATED LINK RF SPECTRUM (X) YES () NO J. IF I. ABOVE IS NO, LIST A MEASURABLE CHARACTERISTIC FREQUENCY -- MHZ K. INDICATE THE FIXED DIFFERENCE FROM ASSIGNED FREQUENCY 0 KHZ L. MINIMUM DEVIATION 172 KHZ M. MAXIMUM DEVIATION 218 KHZ N. FREQUENCY STABILITY +67.3 KHZ O. RF LOSSES BETWEEN XMITTER TERM AND ANTENNA SYSTEM TERM () DB, MEAS. AT () MHZ P. PCM FILTERING BEFORE XMISSION YES() NO() Q. SPECTRUM ANALYSIS REPORT NUMBER () HAS BEEN PROVIDED TEST (is not available). IF NOT, WILL BE AVAILABLE ON () DATE		A. LOCATION OF ANTENNA OR ARRAY ELEMENTS STATION (1170), PHI (174) DEG STATION (1170), PHI (354) DEG STATION (), PHI () DEG STATION (), PHI () DEG B. TYPE Cavity-backed slot C. MODEL 1B84547 D. MANUFACTURER NDAC E. FREQ. RANGE (2200) TO (2300) MHZ F. PREDOMINANT POLARIZATION TYPE CIRC (), ELLIP (), LINEAR (X) G. PREDOMINANT SENSE & DIRECTION (T) LH (), RH (), 0 (), 45 (), 90 (), 135 () H. MAXIMUM POWER GAIN 1 DBI I. MINIMUM POWER GAIN DBI J. LOCATION, IN VEHICLE BODY COORDINATES, OF PIERCING POINT P _V () (SEE PAGES) K. INITIAL ORIENTATION OF P _V DOWN (), UP (), N, E, S, OR W (). OTHER () L. INITIAL ORIENTATION OF P _R () M. INITIAL ORIENTATION OF P _P () N. FORM OF ANTENNA PATTERN DATA (X) MAG TAPE PLUS MATRIX PLOT () PUNCHED TAPE PLUS MATRIX PLOT () OTHER SUBMITTED TO (DRR) WILL BE AVAILABLE ()		O. PATTERN PARAMETERS MEASURED See Remarks g _{LH} (), g _{RH} (), T (), g ₀ () g _φ (), g ₄₅ (), g ₁₃₅ () P. MAIN LOBE BEAM WIDTH IN DEGREES AT -3DB POINTS ELEVATION () AZIMUTH () Q. EFFECTIVE RADIATED POWER (2.2) WATT (USING 0 DBI TRANSMITTING ANTENNA GAIN) R. SPECTRUM RESPONSE REPORT () AVAILABLE () NOT AVAILABLE (IF AVAILABLE PROVIDE FIVE COPIES) S. ANTENNA CONTROLABILITY	
				13. REMARKS Antenna patterns have been submitted to DRR.			

CLASSIFICATION

TELEMETRY SYSTEM (Second Stage)

1. REPLACES PAGE (s)

2. PAGE

1421.1 38

DATED

3. DATE 10 June 1972

4. TEST PROGRAM TITLE

DELTA IMP

5. TEST PROGRAM NO.

2509

6. TEST PROGRAM AGENCY

7. TEST PROGRAM CONTRACTOR

8. REVISION NO.

9. GENERAL INFORMATION

A. TEST CODE:

B. NUMBER OF CHANNELS:

CONTINUOUS: 12

COMMUTATED: (1) PDM (1) PCM

C. NUMBER OF SEGMENTS/CHANNEL:

CHANNEL SEGMENTS

E

45

D. STATE NON-IRIG PARTICULARS:

None

10. TRANSMITTER CHARACTERISTICS

A. LOCATION SECOND STAGE

B. TYPE PCM/FDM/FM/FM

C. MODEL: TR-2302

D. MANUFACTURER: Teledyne

E. LINK FREQUENCY 2241.5 MC

F. TYPE OF MODULATION:

G. BANDWIDTH AT 3DB: .550 MC Total

H. BANDWIDTH AT 60DB: 1.080 MC Total

I. IS THE ASSIGNED FREQUENCY MEASURABLE IN THE MODULATED LINK RF SPECTRUM?

☒ YES ☐ NO

J. IF I ABOVE IS NO, LIST A MEASURABLE CHARACTERISTIC FREQUENCY: MC

K. INDICATE THE FIXED DIFFERENCE FROM ASSIGNED FREQUENCY: 0 KC

L. MINIMUM DEVIATION: +220 KC

M. MAXIMUM DEVIATION: +278 KC

N. FREQUENCY STABILITY: ± 67.3 KC

O. FREQUENCY STABILITY: %C.F. .003

P. AVERAGE POWER: 5 WATTS

Q. CODING AND/OR MODULATION: PCM/PDM/FM/FM (PDM 18 45 X 20)

R. SPECTRUM ANALYSIS REPORT ON THIS

TRANSMITTER:

☐ HAS BEEN PROVIDED

DATE

☐ WILL BE AVAILABLE

DATE

NOTE: Transmitting systems which require extensive periods of "off" checkout time will be required to be equipped with a closed loop or non-radiating checkout device.

11. ANTENNA CHARACTERISTICS

A. LOCATION: STA. 607 AZ. 154° (ETR only)

STA. 613 AZ. 334° (ETR only)

STA. AZ.

STA. AZ.

WITH REFERENCE TO TRUE NORTH AFTER THE VEHICLE IS ERECTED ON THE LAUNCH PAD.

B. TYPE: Cavity-Backed Slot

C. MODEL: 1B84547

D. MANUFACTURER: McDonnell Douglas

E. FREQUENCY RANGE: 2200-2300 MC

F. ☐ TUNABLE ☒ FIXED TUNED

G. PREDOMINANT POLARIZATION: (Check only one)

☐ VERTICAL☐ HORIZONTAL☐ CIRCULAR: SENSE: ☐ LH ☐ RH☒ OTHER Linear

H. MAXIMUM GAIN IN DB WITH RESPECT TO ISOTROPIC: 1 DB

I. MAIN LOBE BEAM WIDTH IN DEGREES AT 3DB POINTS: ELEVATION N/A AZIMUTH N/A

J. EFFECTIVE RADIATED POWER: 3.2 WATTS

(Using O DB transmitting antenna gain)

K. INDICATE THE AVAILABILITY DATE OF THE ANTENNA PATTERN MEASUREMENTS, PER AFSCM 00-4. Submitted: See Tape No. 04111

L. FORM OF ANTENNA PATTERN SUBMITTED

☒ MAG TAPE ☐ TABULATED ☐ PAPER TAPE

M. SPECTRUM RESPONSE REPORT ON THIS ANTENNA:

☐ IS AVAILABLE☒ IS NOT AVAILABLE

(If available, provide frequency list)

(Continued on page 152-1)

CLASSIFICATION

TELEMETRY SYSTEM (SECRET) Stage)			1. REPLACES PAGE (N)	2. PAGE 1421.2	39										
4. TEST PROGRAM TITLE DELTA IMP			5. TEST PROGRAM NO. 2509	6. TEST PROGRAM AGENCY	7. TEST PROGRAM CONTRACTOR										
			DATED	10 June 1972											
			8. REVISION NO.												
12. R.F. TRANSMISSION CHARACTERISTICS			13. PCM DATA		14. DATA TO BE TRANSMITTED AND REMARKS										
A. RF FREQUENCY: 2241.5 MC B. BANDWIDTH AT 3DB POINTS: .55 total MC C. BANDWIDTH AT 80DB POINTS: 1.08 total MC D. DEVIATION: +278 (max) MC E. TYPE MODULATION: PCM/PDM/FM/FM			A. IDENTIFY SERIAL BIT RATE: 13.89 \pm .09 kbs B. INDICATE SERIAL WAVE TRAIN: <input checked="" type="checkbox"/> 2 LEVEL <input type="checkbox"/> MORE THAN 2 LEVEL IF MORE THAN 2 LEVEL: SHOW NUMBER OF LEVELS, WHAT EACH LEVEL REPRESENTS AND AMPLITUDE OF EACH LEVEL IN PERCENTAGE OF TOTAL AMPLITUDE SPREAD. C. IS MODULATION DIRECTLY ON: <input type="checkbox"/> RF CARRIER <input checked="" type="checkbox"/> SUB CARRIER D. SERIAL BINARY "ONE" CAUSES THE RF CARRIER OR SUB CARRIER TO: <input checked="" type="checkbox"/> INCREASE IN FREQUENCY <input type="checkbox"/> DECREASE IN FREQUENCY E. SERIAL WAVE TRAIN: <input type="checkbox"/> RETURNS TO ZERO <input checked="" type="checkbox"/> NON-RETURN TO ZERO <input type="checkbox"/> SPLIT PHASE <input type="checkbox"/> OTHER DESCRIBE: F. WORDS PER MAJOR FRAME: 276 G. MINOR FRAMES PER MAJOR FRAME: 12 H. WORDS PER MINOR FRAME: 23 I. BITS PER WORD: 24 J. SYLLABLES PER WORD: N/A K. BITS PER SYLLABLE: N/A L. CHANNEL ASSIGNMENT: (I.e., channel 247 telemetered on major frame word X, minor frame word Y, syllable Z, etc.) M. MAJOR FRAME SYNC PATTERN: N. MINOR FRAME SYNC PATTERN: 053411166743XXXX, 2 words (octal) every third minor frame O. WORD SYNC PATTERN: P. GIVE SYNC PATTERN OF ANY OTHER WORD WHICH DIFFER FROM THE PATTERN IN (O): Q. FORMAT: <input type="checkbox"/> SHORT CYCLES <input type="checkbox"/> PREMATURE RECYCLES R. BINARY "ONES" AND "ZEROS" CONSTANT WIDTH: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO S. <input type="checkbox"/> BINARY COUNT FOR 100% DATA LEVEL. Variable <input type="checkbox"/> BINARY COUNT FOR 0% DATA LEVEL. Scaling T. SIGNIFICANT BIT COUNT OCCURS: <input checked="" type="checkbox"/> FIRST IN BIT STREAM <input type="checkbox"/> LAST IN BIT STREAM		Inertial Guidance System Parameters: Synchronization is based on bit pattern of last two words in every third frame of the master frame (Word Slots 68, 69, 137, 138, 206, 207, 275, and 276). First word in each group of two contains fixed octal pattern of 05341116. Second word contains four fixed octal digits (6743) together with the following subframe identification codes: <table border="1"> <thead> <tr> <th>Word No.</th> <th>Subframe Ident.</th> </tr> </thead> <tbody> <tr> <td>69</td> <td>2222</td> </tr> <tr> <td>138</td> <td>3333</td> </tr> <tr> <td>207</td> <td>4444</td> </tr> <tr> <td>276</td> <td>1111</td> </tr> </tbody> </table>	Word No.	Subframe Ident.	69	2222	138	3333	207	4444	276	1111
Word No.	Subframe Ident.														
69	2222														
138	3333														
207	4444														
276	1111														

FORM R 122
JULY 70

CLASSIFICATION

VEHICLE TELEMETRY SYSTEMS - CHARACTERISTICS		2. REPLACES PAGE (S)		3. PAGE NO. 1421.3		40	
5. PROGRAM TITLE DELTA - IMP		6. ITEM NO.		7. TEST CODE		8. PROGRAM NO.	
9. DATE		10. REVISION NO.					
10. GENERAL INFORMATION		11. TRANSMITTER CHARACTERISTICS		12A. ANTENNA SYSTEM CHARACTERISTICS		12B. ANTENNA SYSTEM CHARACTERISTICS	
A. RF FREQUENCY 256.2 MHZ B. BANDWIDTH AT 300 0.3 MHZ C. BANDWIDTH AT 600 1.2 MHZ D. DEVIATION +125 MHZ E. TYPE MODULATION		A. LOCATION 3rd stage B. TYPE Solid state C. MODEL T-205-1 D. MANUFACTURER Microcom E. LINK FREQUENCY 256.2 MHZ F. TYPE OF MODULATION FM/FM G. BANDWIDTH AT 300 0.3 MHZ H. BANDWIDTH AT 600 1.2 MHZ I. IS THE ASSIGNED FREQUENCY MEASUR- ABLE IN THE MODULATED LINK RF SPECTRUM (X) YES () NO J. IF I. ABOVE IS NO, LIST A MEASURABLE CHARACTERISTIC FREQUENCY MHZ K. INDICATE THE FIXED DIFFERENCE FROM ASSIGNED FREQUENCY 12.81 KHZ L. MINIMUM DEVIATION +100 KHZ M. MAXIMUM DEVIATION +125 KHZ N. FREQUENCY STABILITY 0.005% KXX O. RF LOSSES BETWEEN XMITTER TERM AND ANTENNA SYSTEM TERM () DB, MEAS. AT () MHZ P. PCM FILTERING BEFORE XMISSION YES() NO() Q. SPECTRUM ANALYSIS REPORT NUMBER () HAS BEEN PROVIDED TO (), IF NOT, WILL BE AVAILABLE ON () DATE		A. LOCATION OF ANTENNA OR ARRAY ELEMENTS STATION (), PHI () DEG STATION (), PHI () DEG STATION (), PHI () DEG STATION (), PHI () DEG B. TYPE Turnstile, 4 element C. MODEL 19.012 D. MANUFACTURER NMSU E. FREQ. RANGE (256.2) MHZ F. PREDOMINANT POLARIZATION TYPE CIRC (X), ELLIP (), LINEAR () G. PREDOMINANT SENSE & DIRECTION () LH(), RH(X), 0(), 45(), 0(), 135() H. MAXIMUM POWER GAIN 3 db DBI I. MINIMUM POWER GAIN DBI J. LOCATION, IN VEHICLE BODY COORDINATES, OF PIERCING POINT P _V () (SEE PAGES) K. INITIAL ORIENTATION OF P _V DOWN (), UP (), N, E, S, OR W () OTHER () L. INITIAL ORIENTATION OF P _R () M. INITIAL ORIENTATION OF P _P () N. FORM OF ANTENNA PATTERN DATA () MAG TAPE PLUS MATRIX PLOT () PUNCHED TAPE PLUS MATRIX PLOT () OTHER SUBMITTED TO () WILL BE AVAILABLE ()		O. PATTERN PARAMETERS MEASURED See remarks g ₀ (), g ₉₀ (), T(), g ₁₈₀ () g ₄₅ (), g ₁₃₅ (), g ₁₃₅ () P. MAIN LOBE BEAM WIDTH IN DEGREES AT -300 POINTS ELEVATION () AZIMUTH () Q. EFFECTIVE RADIATED POWER () WATT (USING 0 DBI TRANSMITTING ANTENNA GAIN) R. SPECTRUM RESPONSE REPORT () AVAILABLE () NOT AVAILABLE (IF AVAILABLE PROVIDE FIVE COPIES) S. ANTENNA CONTROLLABILITY 13. REMARKS 1. Preliminary - to be revised. 2. One commutated channel will be included. 3. Antenna patterns have been submitted to DRR.	

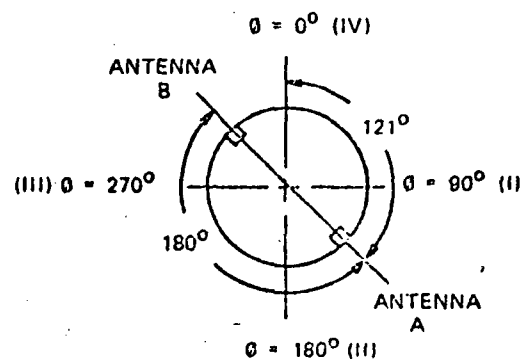
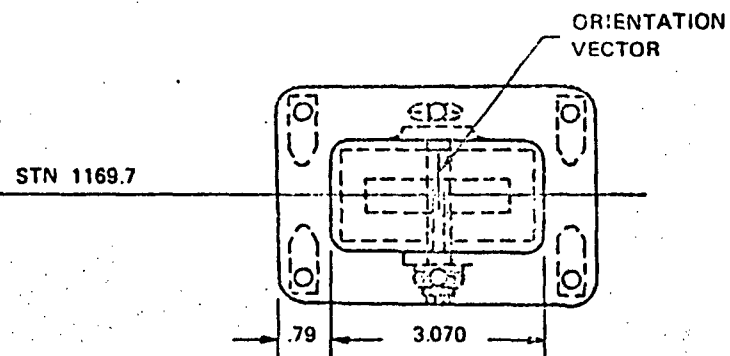
PAGE TITLE) VEHICLE TELEMETRY SYSTEMS - CHARACTERISTICS		2. REPLACES PAGE (S)		3. PAGE NO. 1421 .4 41			
		DATED		4. DATE 10 June 1972			
5. PROGRAM TITLE DELTA IMP		6. ITEM NO.	7. TEST CODE	6. PROGRAM NO. 2509			
11. TRANSMITTER CHARACTERISTICS		12A. ANTENNA SYSTEM CHARACTERISTICS		12B. ANTENNA SYSTEM CHARACTERISTICS			
1. FREQUENCY 136.890 MHz 2. BANDWIDTH AT 300 15 KHz 3. BANDWIDTH AT 600B 30 KHz 4. DEVIATION 1.1 radians 5. TYPE MODULATION PM		A. LOCATION On spacecraft B. TYPE Data fixed freq. C. MODEL D. MANUFACTURER GSFC E. LINK FREQUENCY 136.890 MHz F. TYPE OF MODULATION PM G. BANDWIDTH AT 300 15 KHz H. BANDWIDTH AT 600B 30 KHz I. IS THE ASSIGNED FREQUENCY MEASUR- ABLE IN THE MODULATED LINK RF SPECTRUM (X) YES () NO J. IF I. ABOVE IS NO, LIST A MEASURABLE CHARACTERISTIC FREQUENCY MHz K. INDICATE THE FIXED DIFFERENCE FROM ASSIGNED FREQUENCY KHz L. MINIMUM DEVIATION 0.3 radians M. MAXIMUM DEVIATION 1.1 radians N. FREQUENCY STABILITY +3 KHz O. RF LOSSES BETWEEN XMITTER TERM AND ANTENNA SYSTEM TERM (80) DB, MEAS. AT 136.8 MHz P. PCM FILTERING BEFORE XMISSION YES (X) NO () Q. SPECTRUM ANALYSIS REPORT NUMBER () HAS BEEN PROVIDED TO () IF NOT, WILL BE AVAILABLE ON () DATE		A. LOCATION OF ANTENNA OR ARRAY ELEMENTS STATION (), PHI () DEG STATION (), PHI () DEG STATION (), PHI () DEG STATION (), PHI () DEG B. TYPE Turnstile C. MODEL D. MANUFACTURER GSFC E. FREQ. RANGE (130) TO (150) MHz F. PREDOMINANT POLARIZATION TYPE CIRC (X), ELLIP (), LINEAR () G. PREDOMINANT SENSE & DIRECTION (T) LH (), RH (X), 0 (), 45 (), 90 (), 135 () H. MAXIMUM POWER GAIN +2 DBI I. MINIMUM POWER GAIN -7 DBI J. LOCATION, IN VEHICLE BODY COORDINATES, OF PIERCING POINT P _V (Stack 7 $\theta = 90^\circ$) (SEE PAGES) K. INITIAL ORIENTATION OF P _V DOWN (), UP (), N, E, S, OR W (). OTHER () L. INITIAL ORIENTATION OF P _R () M. INITIAL ORIENTATION OF P _P () N. FORM OF ANTENNA PATTERN DATA () MAG TAPE PLUS MATRIX PLOT () PUNCHED TAPE PLUS MATRIX PLOT (X) OTHER SUBMITTED TO (YES) WILL BE AVAILABLE ()		O. PATTERN PARAMETERS MEASURED g _{0H} (), g _{0V} (), T (), g ₀ () g ₁ (), g ₄₅ (), g ₁₃₅ () P. MAIN LOBE BEAM WIDTH IN DEGREES AT -300 POINTS ELEVATION () AZIMUTH () Q. EFFECTIVE RADIATED POWER (8) WATT (USING 0 DBI TRANSMITTING ANTENNA GAIN) R. SPECTRUM RESPONSE REPORT (X) AVAILABLE () NOT AVAILABLE (IF AVAILABLE PROVIDE FIVE COPIES) S. ANTENNA CONTROLLABILITY None	
				13. REMARKS Omni directional			

(PAGE TITLE) VEHICLE TELEMETRY SYSTEMS - CHARACTERISTICS		2. REPLACES PAGE (S) DATED		3. PAGE NO. 1421 .5 4			
5. PROGRAM TITLE DELTA IMP		8. ITEM NO.		9. TEST CODE			
6. PROGRAM NO. 2509		7. REVISION NO.		4. DATE 10 June 1972			
10. GENERAL INFORMATION		11. TRANSMITTER CHARACTERISTICS		12A. ANTENNA SYSTEM CHARACTERISTICS			
A. RF FREQUENCY 137.920 MHZ B. BANDWIDTH AT 300 15 KHz C. BANDWIDTH AT 600B 30 KHz D. DEVIATION 1.1 Radians E. TYPE MODULATION PM		A. LOCATION On spacecraft B. TYPE Fixed freq. data C. MODEL D. MANUFACTURER GSFC E. LINK FREQUENCY 137.920 MHZ F. TYPE OF MODULATION PM G. BANDWIDTH AT 300 15 KHz H. BANDWIDTH AT 600B 30 KHz I. IS THE ASSIGNED FREQUENCY MEASUR- ABLE IN THE MODULATED LINK RF SPECTRUM (X) YES () NO J. IF I. ABOVE IS NO, LIST A MEASURABLE CHARACTERISTIC FREQUENCY MHZ K. INDICATE THE FIXED DIFFERENCE FROM ASSIGNED FREQUENCY KHz L. MINIMUM DEVIATION 1.1 radians M. MAXIMUM DEVIATION 1.1 radians N. FREQUENCY STABILITY +3 KHz O. RF LOSSES BETWEEN XMITTER TERM- AND ANTENNA SYSTEM TERM (80)DB, MEAS. AT (137)MHZ P. PCM FILTERING BEFORE XMISSION YES(X) NO() Q. SPECTRUM ANALYSIS REPORT NUMBER () HAS BEEN PROVIDED TO () IF NOT, WILL BE AVAILABLE ON () DATE		A. LOCATION OF ANTENNA OR ARRAY ELEMENTS STATION (), PHI () DEG STATION (), PHI () DEG STATION (), PHI () DEG STATION (), PHI () DEG B. TYPE Turnstile C. MODEL D. MANUFACTURER GSFC E. FREQ. RANGE (130) TO (150)MHZ F. PREDOMINANT POLARIZATION TYPE CIRC (X), ELLIP (), LINEAR () G. PREDOMINANT SENSE & DIRECTION (T) LH (), RH (X), 0 (), 45 (), 90 (), 135 () H. MAXIMUM POWER GAIN +2 DBI I. MINIMUM POWER GAIN -7 DBI J. LOCATION, IN VEHICLE BODY COORDINATES, OF PIERCING POINT P _y (Stack 7) θ = 90° (SEE PAGES) K. INITIAL ORIENTATION OF P _y DOWN (), UP (), N, E, S, OR W (). OTHER () L. INITIAL ORIENTATION OF P _R () M. INITIAL ORIENTATION OF P _P () N. FORM OF ANTENNA PATTERN DATA () MAG TAPE PLUS MATRIX PLOT () PUNCHED TAPE PLUS MATRIX PLOT (X) OTHER SUBMITTED TO () WILL BE AVAILABLE ()		12B. ANTENNA SYSTEM CHARACTERISTICS O. PATTERN PARAMETERS MEASURED G ₀ (), G ₄₅ (), T (), G ₉₀ () G ₁₃₅ (), G ₁₈₀ (), G ₂₂₅ () P. MAIN LOBE BEAM WIDTH IN DEGREES AT -30B POINTS ELEVATION () AZIMUTH () Q. EFFECTIVE RADIATED POWER (12)WATTS (USING 0 DBI TRANSMITTING ANTENNA GAIN) R. SPECTRUM RESPONSE REPORT (X) AVAILABLE () NOT AVAILABLE (IF AVAILABLE PROVIDE FIVE COPIES) S. ANTENNA CONTROLLABILITY None 13. REMARKS Omni directional	

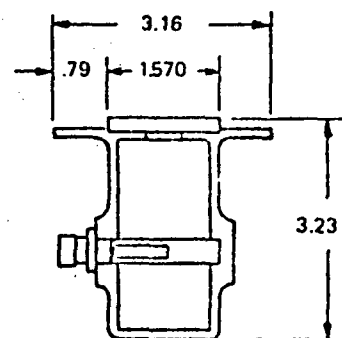
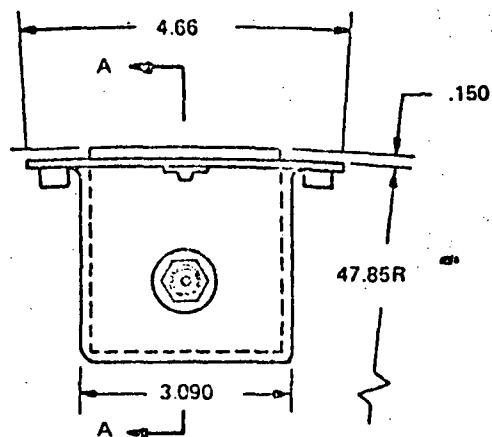
1. CLASSIFICATION _____

(PAGE TITLE) TELEMETRY SYSTEM (FIRST STAGE)			2. REPLACES PAGE (S) DATE:	3. PAGE NO. 1422 43
5. PROGRAM TITLE DELTA IMP	6. ITEM NO.	9. TEST CODE	6. PROGRAM NO. 2509	7. REVISION NO.
4. DATE 10 June 1972				

10.



ANTENNA LOCATIONS
VIEW LOOKING FORWARD



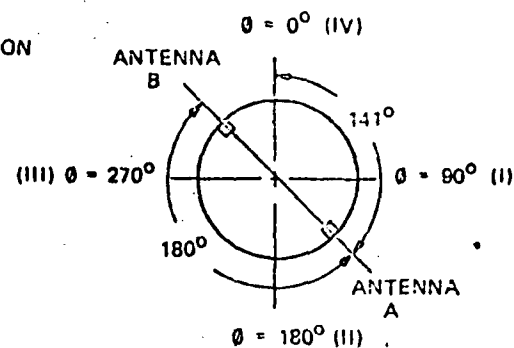
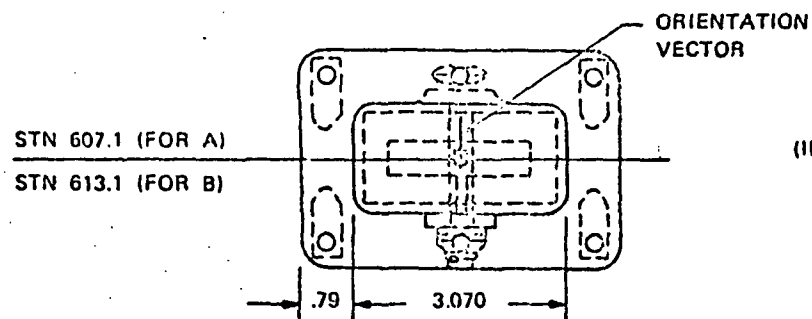
SECTION A-A

5. CLASSIFICATION _____

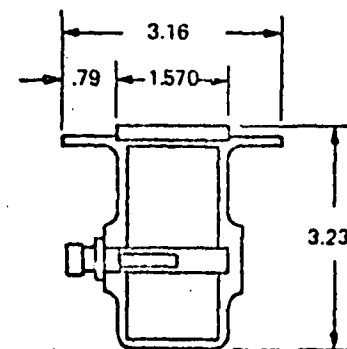
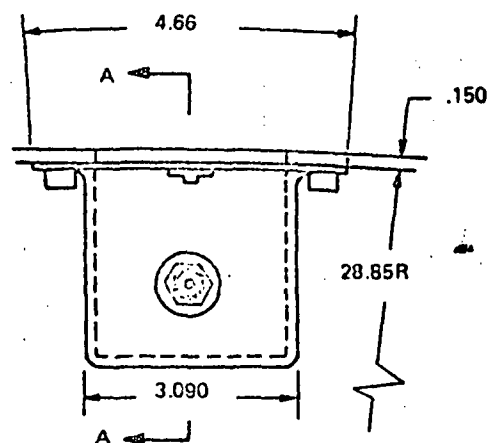
1. CLASSIFICATION _____

(PAGE TITLE) TELEMETRY SYSTEM (SECOND STAGE)			2. REPLACES PAGE (S)		3. PAGE NO. 1122.1 44	
5. PROGRAM TITLE DELTA IMP			6. ITEM NO.	9. TEST CODE	6. PROGRAM NO. 2509	7. REVISION NO.
					5. DATE 10 June 1972	

10.



ANTENNA LOCATIONS
VIEW LOOKING FORWARD



SECTION A-A

FORM R G/C
JULY 70

1. CLASSIFICATION _____

1. (PAGE TITLE) COMMAND CONTROL/DESTRUCT SYSTEM		2. REPLACES PAGE (S)	3. PAGE NO. 1-130	45
		DATED	4. DATE 10 June 72	
5. PROGRAM TITLE DELTA IMP		6. PROGRAM NO. 2509	7. REVISION NO.	
8. ITEM NO.	9. TEST CODE	10.		
1	A,G	It is requested that the command transmitter be set up to deviate ± 62.5 kHz $\pm 5\%$ per tone without compression. The combined deviation for two simultaneously transmitted tones is to be no greater than 125 kHz and no less than 113 kHz.		
2	A	<p><u>Sending of ARM Function during first stage powered flight:</u></p> <p>Separation of the first and second stages, and ignition of the second stage engine, occur by sequence 1 of the second stage programmer. The second stage programmer is started when the first first stage staging relay (K74) is energized from the MECO bus.</p> <p>If ARM is sent, the first stage VECO and MECO relays, and the MECO bus, are energized, but the circuit from the MECO bus to the staging relay is interrupted. The main and vernier engines shut down, but the second stage programmer is not started, and therefore separation does not occur. However, the ARM relay does not have a lock-in feature. Removing the ARM command re-establishes the connection from the staging relay to the MECO bus. Shutdown of the main engine has closed the FIP switches connecting the MECO bus to the MECO enable bus. Energizing the MECO enable bus is a first stage timer function, and the timer continues to run. Thus, removing ARM will result in blast band jettison and second stage programmer start, either immediately or when the MECO enable function time is reached.</p> <p>In the second stage the ARM command actuates two relays. One relay provides a backup ARM signal for first stage shutdown. Both relays establish connections from the engine start bus to the SECO bus. If there is no power on the engine start bus, establishing these connections causes no change of state on the SECO bus. As there is no power on the engine start bus until second stage programmer Sequence 1 has occurred, and the ARM relays do not lock in, sending and removing ARM before Sequence 1 will not preclude subsequent second stage ignition.</p> <p>See the Flight Termination Report for further details.</p>		

FORM R G/A
JULY 70

CLASSIFICATION

COMMAND CONTROL / DESTROY SYSTEM FIRST AND SECOND STAGES

1. REPLACES PAGE (d)

2. PAGE

1431

46

DATED

3. DATE

10 June 72

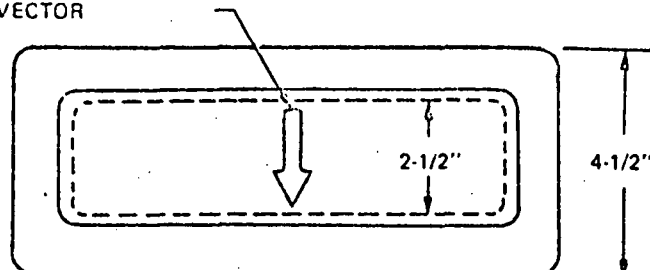
8. REVISION NO.

4. TEST PROGRAM TITLE DELTA IMP		5. TEST PROGRAM NO. 2509	6. TEST PROGRAM AGENCY	7. TEST PROGRAM CONTRACTOR
3. GENERAL INFORMATION		10. RECEIVER CHARACTERISTICS	11. ANTENNA CHARACTERISTICS	12. DESTROY CONTROL SYSTEM DESCRIPTION
A. TEST CODE: A, G B. TRANSMISSION OF COMMAND FUNCTIONS: TYPE: <input checked="" type="checkbox"/> ON-OFF <input type="checkbox"/> PROPORTIONAL C. NO. OF ON-OFF CHANNELS TO BE TRANSMITTED: 3 D. BANDWIDTH OF PROPORTIONAL CHANNELS NA KC INCLUSIVE E. REAL-TIME MONITORING OF TRANSMITTED COMMAND FUNCTIONS REQUIRED: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO F. A FLIGHT-CONTROL CONSOLE <input type="checkbox"/> WILL <input checked="" type="checkbox"/> WILL NOT BE USED. G. PORTION, OR DURATION, OF FLIGHT THROUGHOUT WHICH RADIO COMMAND IS REQUIRED: End of 2nd Stage boost. To disable the vehicle destroy system. H. IN-FLIGHT TELEMETERED DATA: CHANNEL NO. NA R-F LINK NO. WILL BE USED TO TRANSMIT COMMAND CONTROL SIGNAL INTENSITY FROM MISSILEBORNE RECEIVER. I. DOES COMMAND RECEIVER HAVE A REMOTE TURN-OFF CAPABILITY? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		A. LOCATION: Second STAGE. B. TYPE: FM C. MODEL: MCR-312B D. MANUFACTURER: Motorola E. NUMBER INSTALLED: 2 F. FREQUENCY RANGE: 406-450 MC G. <input type="checkbox"/> TUNABLE <input checked="" type="checkbox"/> FIXED TUNED H. INTERMEDIATE FREQUENCY: 1ST 74.64 MC, 2ND 10.7 MC I. LOCAL OSCILLATOR FREQUENCY <input type="checkbox"/> ABOVE, <input checked="" type="checkbox"/> BELOW COMMAND TRANSMITTER FREQUENCY. J. METHOD OF FREQUENCY CONTROL: 1ST OSC: Crystal, 2ND OSC: Crystal K. FREQUENCY STABILITY: ± 0.042 MC L. FREQUENCY STABILITY: % C. F. M. SENSITIVITY: MAXIMUM: DEM AT MC MINIMUM: DEM AT MC NOMINAL: Note 4 DEM AT 416 MC N. SELECTIVITY: (Override) 3DB MC 20DB MC 60DB 0.75 max MC O. BANDWIDTH (For a given optimum signal) AT 6DB DOWN KC 40DB DOWN KC 60DB DOWN 1500 max KC P. DEVIATION REQUIRED: ± 62.5 KC Q. CAPTURE RATIO: 0.8 R. SPURIOUS RESPONSE REJECTION: 70 DB S. MINIMUM AT MC T. ATTACH A PLOT OF SIGNAL PLUS NOISE TO NOISE RATIO IN DB VERSUS INPUT SIGNAL IN UV OVER A RANGE OF 1-100 UV. U. A SPECTRUM ANALYSIS RPT ON THIS RECEIVER: <input type="checkbox"/> BEEN GIVEN <input type="checkbox"/> BE AVAILABLE (Data) *	A. LOCATION: STA. 749.7 $\cdot 45^\circ$ AZ STA. 749.7 $\cdot 135^\circ$ AZ STA. 749.7 $\cdot 225^\circ$ AZ STA 749.7 $\cdot 315^\circ$ AZ WITH REFERENCE TO TRUE NORTH AFTER THE VEHICLE IS ERECTED ON THE LAUNCH PAD. B. TYPE: Cavity-Backed-Slot C. MODEL: MDC-1B08305 D. MANUFACTURER: Transco Products E. FREQUENCY RANGE: 400-450 MC F. <input checked="" type="checkbox"/> TUNABLE <input type="checkbox"/> FIXED TUNED G. PREDOMINANT POLARIZATION (Check only one) <input type="checkbox"/> VERTICAL <input type="checkbox"/> HORIZONTAL <input type="checkbox"/> CIRCULAR: SENSE: <input type="checkbox"/> LH <input type="checkbox"/> RH <input checked="" type="checkbox"/> OTHER Linear H. MAXIMUM GAIN IN DB WITH RESPECT TO ISOTROPIC: 0 DB I. MAXIMUM NULL IN DB WITH RESPECT TO ISOTROPIC: -13 db or better over 95% of sphere or coverage DB J. LOSS IN TRANSMISSION LINES: .6 DB AT 416 MC K. ANTENNA DIPLEXER: .4 DB LOSS AT 416 MC L. REQUIRED SIGNAL STRENGTH - CALCULATED UV/METER, ASSUMING LEFT-HAND-SENSED, CIRCULARLY POLARIZED TRANSMITTING ANTENNA. M. ATTACH ANTENNA PATTERN MEASUREMENTS AND A SCHEMATIC OF ANTENNA SYSTEM AS PER AFSCM 80-4. See Note 4 N. A SPECTRUM RESPONSE REPORT ON THIS ANTENNA: <input type="checkbox"/> IS AVAILABLE <input checked="" type="checkbox"/> IS NOT AVAILABLE (If available, provide five copies)	Note 1: The Command Control Destroy system on the second stage vehicle consists of two independent systems powered by independent batteries. Each receiver is fed from two antennas located on diametrically opposite sides of the vehicle. Note 2: Receiver No. 1 feeds the destroy command (28 vdc) thru an RF filter to a second stage S & A device. The arm command from Receiver No. 1 gives a SECO signal. Note 3: Receiver No. 2 feeds the destroy command (28 vdc) thru an RF filter to a second stage S & A device and also to a first stage S & A device. The arm command from Receiver No. 2 gives a SECO signal and also gives a signal to the first stage that commands MECO, VECO, and disables first and second stage separation. Receiver No. 1 is powered by the second stage control battery and Receiver No. 2 is powered by the second stage instrumentation battery. Note 4: Magnetic tape transmitted to DRR by NTSD on Feb 14, 1969, Reel No. 13508.
		14. COORDINATION SIGNATURE		

(PAGE TITLE) AIRBORNE FLIGHT TERMINATION SYSTEM FIRST STAGE COMMAND DESTRUCT RECEIVER ANTENNA CONFIGURATION			2. REPLACES PAGE (S) DATED	3. PAGE NO. 1432 47
5. PROGRAM TITLE DELTA IMP	6. ITEM NO.	7. TEST CODE A,G	8. PROGRAM NO. 2509	9. DATE 10 JUNE 72
			10. REVISION NO.	

13.

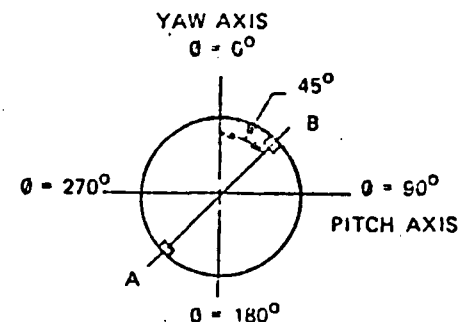
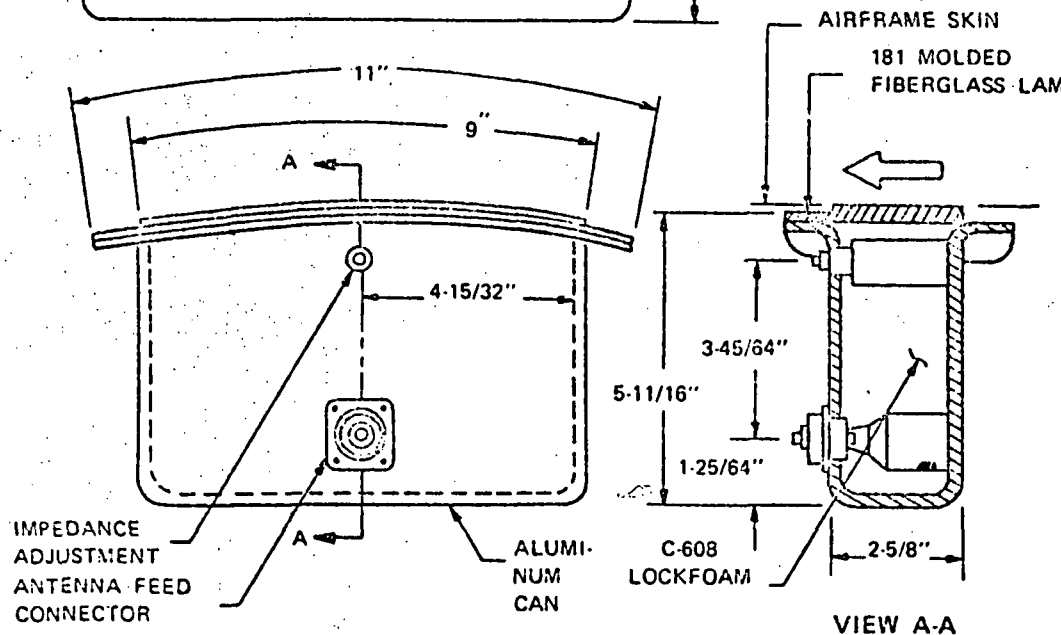
ORIENTATION
VECTOR



NOTE: ONE ANTENNA PAIR INSTALLED AT STATION 974 FOR ALL MISSIONS.

DIRECTION OF ORIENTATION VECTOR

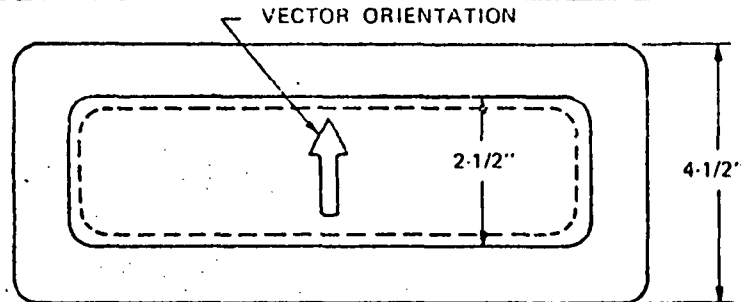
A: $\theta = 3^\circ$ $\theta = 225^\circ$
 B: $\theta = 3^\circ$ $\theta = 45^\circ$



ANTENNA LOCATION VIEW LOOKING FORWARD

1. PROGRAM TITLE COMMAND CONTROL/DESTRUCT SYSTEM (SECOND STAGE)		2. REPLACES PAGE (S) DATE:		3. PAGE NO. 1432.1 48	
4. PROGRAM TITLE DELTA IMP		5. ITEM NO.		6. TEST CODE A, G	
7. PROGRAM NO. 2509		8. DATE 10 June 72		9. REVISION NO.	

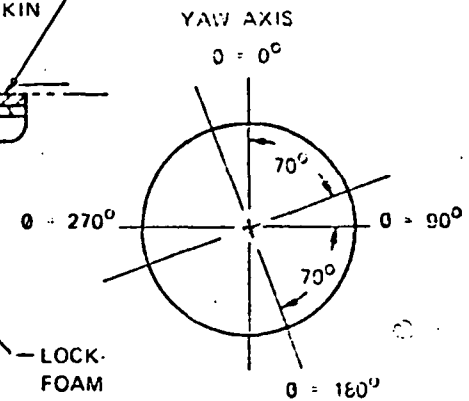
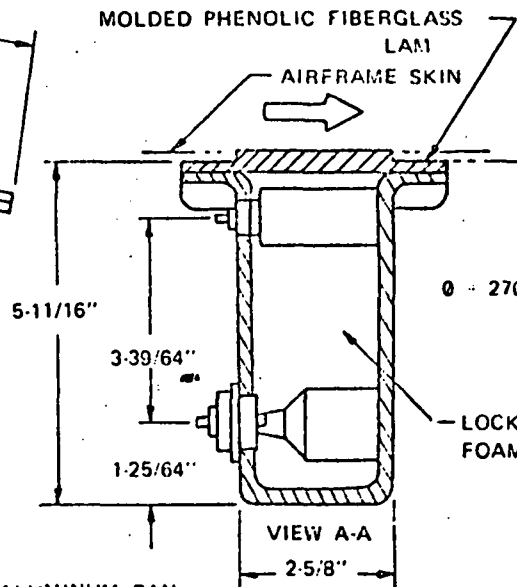
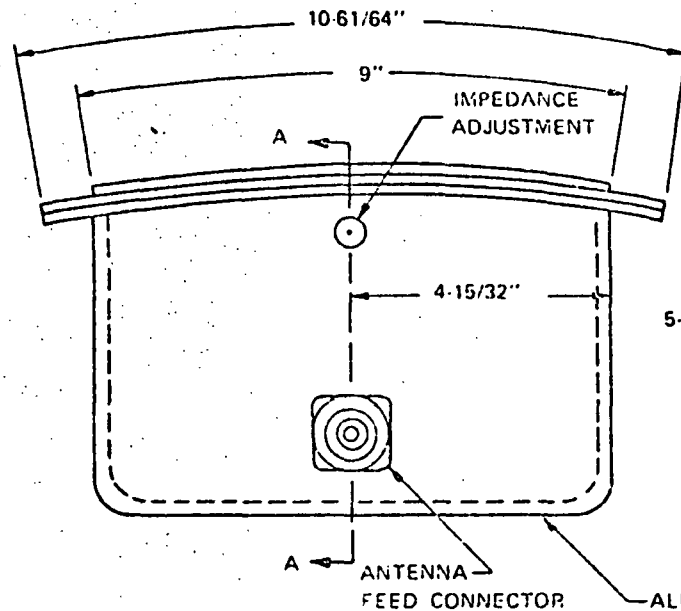
10.



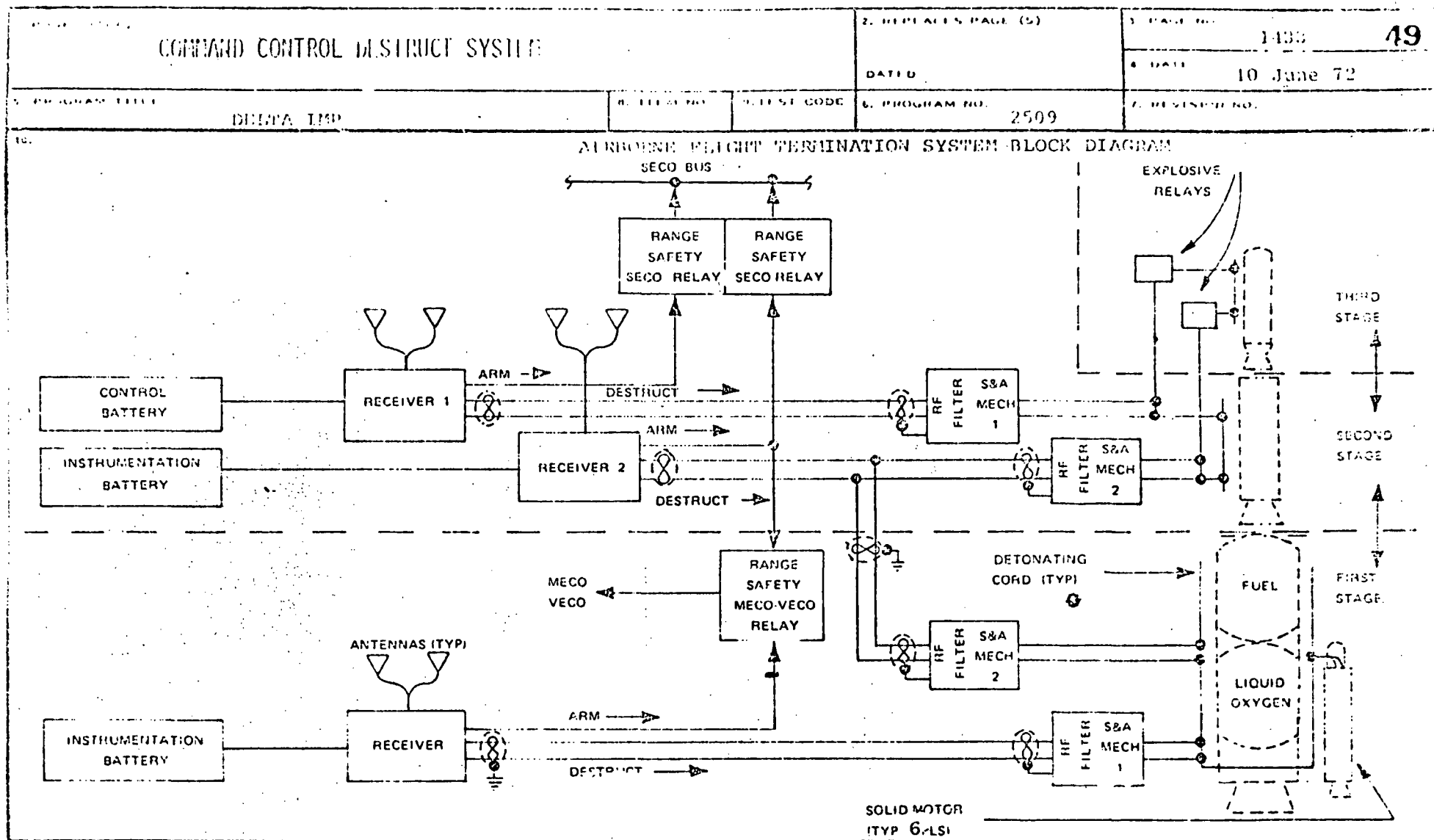
NOTE: ANTENNAS INSTALLED AT STA 750
FOR ALL MISSIONS

DIRECTION OF ORIENTATION VECTOR

$\theta = 70^\circ$	$\theta = 45^\circ$
$\theta = 160^\circ$	$\theta = 45^\circ$
$\theta = 250^\circ$	$\theta = 45^\circ$
$\theta = 340^\circ$	$\theta = 45^\circ$



ANTENNA STATION VIEW LOOKING
FORWARD



2. REPLACES PAGE (S)		3. PAGE NO. 1610	50
DATED		4. DATE 10 June 72	
5. PROGRAM TITLE DELTA IMP		6. PROGRAM NO. 2509	7. REVISION NO.

9. PRELAUNCH TEST NAME	11. OD Test No.	10. PRELAUNCH TEST NAME	12. OD Test No.
1. LAUNCH - To demonstrate satisfactory performance of the entire launch vehicle and ground support equipment in placing the IMP spacecraft into the desired orbit of 30 to 40 earth radii. Includes all countdown activities (August 23, 1972, duration: 10 hr).	2509/ 1361 Code G-9	5. MINOR SUPPORT - To minimize expenditures, several minor support tests will be accomplished: Solid Motor Erection - L-6 to 9 weeks Spacecraft RF Test Data Flow Test (DIGS) Tel 4/Sta 91/Tel 4 and AE	N/A N/A N/A N/A
2. SERVICING - To satisfactorily and safely load second stage propellants into the second stage (F-1 day, duration: 10 hr).	2515B/ TBD Code G-15B		
3. ELECTRICAL CHECKS - To satisfactorily demonstrate a programmer/sequencer run on external power and to load check the internal batteries. This test on F-2 day is preceded by an engine sequencing test and followed by a power-on stray voltage test (F-2 days, duration test: 3 hr, RF clearance: 6 hr).	2515A/ TBD Code G-15A		
4. SIMULATED FLIGHT TEST - A complete programmer run is accomplished first on external power, then on internal flight batteries (F-7 days, duration: 4 hr).	2534A/ TBD Code G-34A		

1. CLASSIFICATION _____

(PAGE TITLE) MAJOR MISSION EVENTS - LAUNCH PHASE					2. REPLACES PAGE (S) DATED		3. PAGE NO. 1710 51 4. DATE 10 June 72			
5. PROGRAM TITLE DELTA IMP					9. TEST CODE A		6. PROGRAM NO. 2509		7. REVISION NO.	
13. SPHEROID <div style="text-align: right;">A = B =</div>										
10. ITEM NO.	11. EVENT NO.	12. DESCRIPTION	13. TIME	14. FLIGHT PATH ANGLE	15. VEL ()	16. ALT ()	17. GROUND RANGE ()	18. X ()	19. Y ()	20. Z ()
21. COORD. SYSTEM										
22. REMARKS										
Mission Title	Launch Date	Launch Az	Launch Veh	S/C Traj/Orbit	2nd Stg Orbit	Traj Data Avail	Dispersions			
IMP-H	July 1972	95 Deg	1604	Highly elliptical orbit	95 x 350 nmi	Memo A3-250	Not			
				250 x 134,000 nmi		AMOCN 72 267	Available			
IMP-J	3rd Qtr 73		2314	28.5° inclination		dtd 3/2/72				
				4th stg will raise		(AB603D169RR5				
				perigee to 100,200 nmi		Case 1)				

FORM R 140
JULY 70

1. CLASSIFICATION _____

1. CLASSIFICATION

(PAGE TITLE)

MAJOR MISSION EVENTS - FLIGHT

2. REPLACES PAGE (5)

3. PAGE NO.

1711

52

DATED

4. DATE 10 June 1972

5. PROGRAM TITLE

DELTA IMP

9. TEST CODE

A

6. PROGRAM NO.

2509

7. REVISION NO.

8. ITEM NO.	10. EVENT NO.	11. EVENT DESCRIPTION	12. ELAPSED TIME	13. POSITION			14. REV NO.	15. REMARKS
				A. LAT	B. LONG	C. ALT ()		
		Liftoff	0.000					
		Begin Roll Program	2.000					
		End Roll Program; Begin						
		First Pitch Rate	6.5					
		Solid Motor Burnout	38.19					
		Solid Drop	85.00					
		Sensed MECO	265.23					
		Vernier Engine Cutoff	271.23					
		First Stage Separation	273.23					
		Second Stage Ignition	277.23					
		Start of Steady State Burn						
		88% Chamber Pressure						
		(110 psia)	277.534					
		Jettison Fairing	295.00					
		Second Engine Cutoff						
		Command	603.63					
		First Cutoff - State II	603.98					
		Start Stage III Ignition						
		Time Delay Relay; Fire						
		Spin Rockets	1302.95					
		Jettison Second Stage,						
		Activate Retro System	1304.95					
		Stage III Ignition	1317.95					
		Stage III Burnout	1361.55					
		Jettison Stage III	1462.95					

FORM R 141
JULY 70

1. CLASSIFICATION

1. CLASSIFICATION _____

(PAGE TITLE)

TRAJECTORY DATA - LAUNCH

2. REPLACES PAGE (S)

3. PAGE NO. 1722

53

DATED

4. DATE 10 June 1972

5. PROGRAM TITLE

DELTA IMP

8. ITEM NO.

9. TEST CODE

6. PROGRAM NO.

2509

7. REVISION NO.

10. LAUNCH AZIMUTH

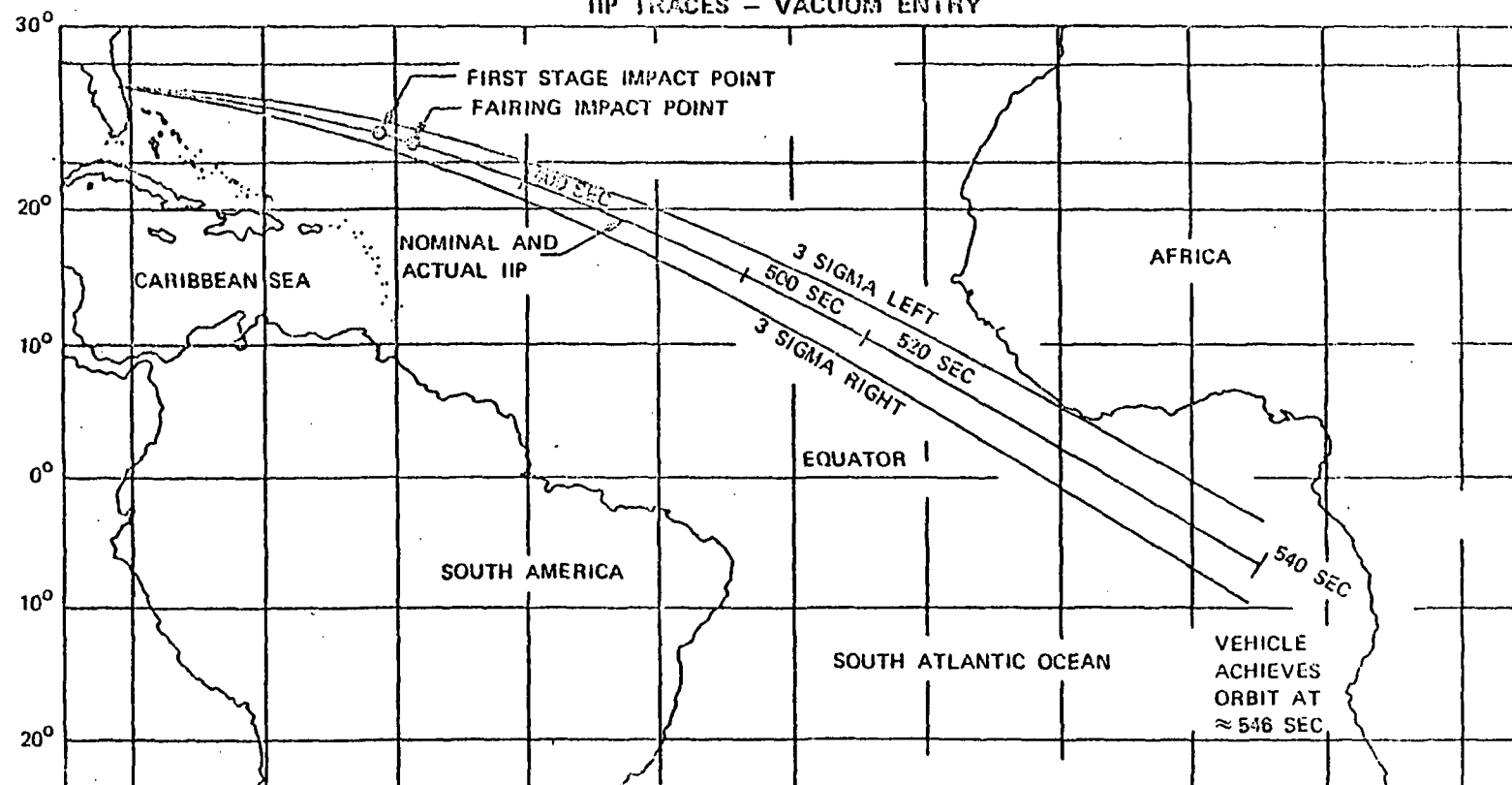
115°

11. FLIGHT AZIMUTH

95°

11. PLOTS

IMP NOMINAL AND 3 SIGMA DISPERSION IIP TRACES - VACUUM ENTRY



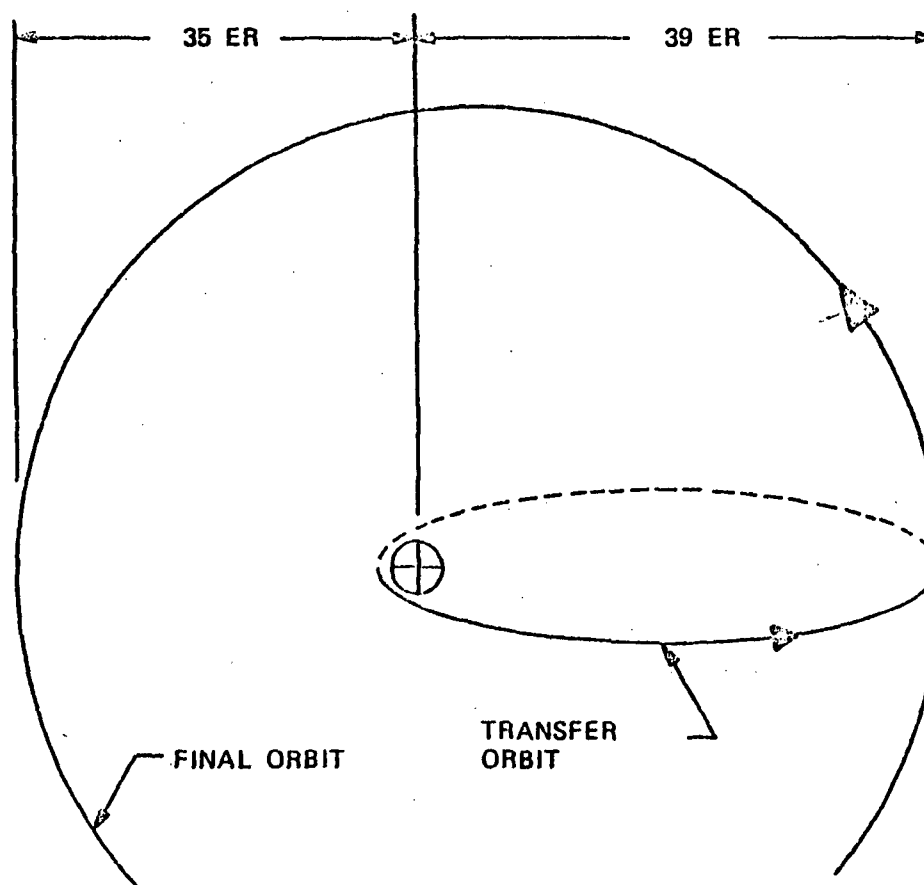
FORM R 144
JULY 70

1. CLASSIFICATION _____

1. CLASSIFICATION _____

(PAGE TITLE) TRAJECTORY DATA - ORBITAL AND SPACE			2. REPLACES PAGE (S) DATED _____		3. PAGE NO. 1723	54
					4. DATE 10 June 1972	
5. PROGRAM TITLE DELTA IMP	8. ITEM NO.	9. TEST CODE A	6. PROGRAM NO. 2509		7. REVISION NO.	

10. SPACE PATH DIAGRAM - PLANNED TRAJECTORY



FORM R 145
JULY 70

1. CLASSIFICATION _____

1. CLASSIFICATION _____

(PAGE TITLE) OPERATIONAL HAZARDS - REPORTS			2. REPLACES PAGE (S)	3. PAGE NO. 1810	55
			DATED	4. DATE 10 June 1972	
5. PROGRAM TITLE DELTA IMP			6. PROGRAM NO. 2509	7. REVISION NO.	
8. ITEM NO.	9. TEST CODE	10. REPORT NAME	11. DATE REPORT SUPPLIED		12. DATE REPORT WILL BE SUPPLIED
1	AG	IMP H/J System Safety Plan (H, JSP-002)			ASAP
2	AG	Delta Handling and Checkout Procedures (H&CO)			ASAP
3	A	Delta-IMP Countdown			L-7WD
4		IMP-H Spacecraft Handling Plan (HHP-002)			ASAP
5	AG	IMP-H Pyrotechnic Handling Procedure (HHP-005)			ASAP
6	A	Detailed Test Objectives (DTO)			ASAP

FORM R 147
JULY 79

1. CLASSIFICATION _____

PAGE TITLE		METRIC DATA		7. REPLACES PAGE (S)		3. PAGE NO. 2100		56	
				DATED		4. DATE 10 June 72			
1. PROGRAM TITLE		DELTA IMP		6. PROGRAM NO. 2509		7. REVISION NO.			
8. ITEM NO.	9. TEST CODE	10.							
<p>NOTE: METRIC SUPPORT IS REQUIRED BY THE FOLLOWING RADARS ONLY: 0.18, 19.18, 7.18, 91.18, 12.16. NO REQUIREMENT CONTAINED IN THIS DOCUMENT WILL BE INTERPRETED TO REQUIRE ANY OTHER SUPPORT.</p>									
1	A	<p><u>Post-Test Metric Data</u> The coordinate system for post-test metric data should have an earth shape simulation based on the 1866 Clark Spheroid and should be tabulated using the cartesian coordinate system with the origin located at mean sea level at the launch site and rotating with the earth; X is positive true North, Y is positive true East, and Z is positive outward and perpendicular to the surface of the earth.</p>							
2	A	<p><u>Flight Phases</u> Launch phase consists of the interval from liftoff to third stage burnout or injection into orbit, or loss of signal (LOS) of the last AFETR station unless otherwise noted.</p>							
3	A	<p><u>Timing</u> Timing correlation will be 2 milliseconds during first and second stage powered flight and within 10 milliseconds between launch and the limit of AFETR acquired data unless otherwise indicated. Range time will be recorded on all raw data.</p>							
4	A	<p><u>Data Reduction and Distribution</u> (a) Processing and reduction will be accomplished by AFETR. Data will be furnished in the form of tabulations and magnetic tapes. (b) Reduced position, velocity and acceleration data will be in feet, feet/seconds, and feet/seconds²; time will be given in seconds. (c) Standard AFETR 51 point smoothing is required. End point smoothing is to be used at discontinuous trajectory points. (d) The trajectory points of interest, i.e., liftoff, main engine burnout, second stage start, second stage burnout, etc., will be furnished to Range directly.</p>							
5	A	<p><u>Liftoff Message</u> Time of liftoff will be transmitted (TTY) to GUNV, GOPS, GPHY & GPOB</p>							

FOR: R G/A
JULY 70

1. CLASSIFICATION _____

3. (PAGE TITLE) METRIC LAUNCH DATA						2. REPLACES PAGE (S) DATED _____		3. PAGE NO. 2110 57	
5. PROGRAM TITLE DELTA IMP						6. PROGRAM NO. 2509		4. DATE 10 June 72	
7. REVISION NO.									
8. ITEM NO	9. TEST CODE	10. DATA REQUIRED	11. INTERVAL (RANGE-ALT.-TIME)	12. DATA POINTS/SEC	13. DATA PRIORITY	14. DATA ACCURACY		15. REAL TIME RELAY	16. PURPOSE AND/OR REMARKS
						A. VALUE	B. CLASS		
1	A	Liftoff Time	N/A	--		0.001 Sec	II		Include in PTR and final Flight report.
2	A	First Stage (Booster) Position	T+0 to 1,000 ft altitude*	30*		2.0 ft 0.5 ft	II III		
			1,000 ft alt to separation +5 sec	5		10-200 ft 10-200 ft	II III		
3	A	First Stage (Booster) Velocity	T+0 to 1,000 ft altitude*	30*		0.3 ft/sec	II		
			1,000 ft alt to separation +5 sec	See remarks		2 ft/sec 0.5 ft/sec	II III		Class 3 accuracy decreases lineally with time from 10 ft to 200 ft.
4	A	First Stage (Booster) Acceleration	T+0 to 1,000 ft altitude*	30*		0.4 ft/sec ²	II		
			1,000 ft alt to separation +5 sec	5		4.0 ft/sec ²	II		Smoothing to be compatible with accuracy requirements.
*Do not set up or process metric optics unless requested in the applicable OR.									

FORM R 209
JULY 70

1. CLASSIFICATION _____

1. CLASSIFICATION _____

(PAGE TITLE) METRIC MIDCOURSE DATA						2. REPLACES PAGE (S)		3. PAGE NO. 2111		58
						DATED		4. DATE 10 June 72		
5. PROGRAM TITLE DELTA IMP						6. PROGRAM NO. 2509		7. REVISION NO.		
8. ITEM NO	9. TEST CODE	10. DATA REQUIRED	11. INTERVAL (RANGE-ALT.-TIME)	12. DATA POINTS/SEC	13. DATA PRIORITY	14. DATA ACCURACY		15. REAL TIME RELAY	16. PURPOSE AND/OR REMARKS	
						A. VALUE	B. CLASS			
1	A	Second stage position velocity and acceleration	1st-2nd stage separation through SECO plus 60 sec	10		0.5 nm in position 0.1 nm in position	II III			

FORM R 209
JULY 70

1. CLASSIFICATION _____

1. (PAGE TITLE) METRIC ORBITAL AND SPACE DATA						2. REPLACES PAGE (S)		3. PAGE NO. 2112		59	
5. PROGRAM TITLE DELTA IMP						6. PROGRAM NO. 2509		4. DATE 10 June 72			
7. REVISION NO.											
8. ITEM NO	9. TEST CODE	10. DATA REQUIRED	11. INTERVAL (RANGE-ALT.-TIME)	12. DATA POINTS/SEC	13. DATA PRIORITY	14. DATA ACCURACY		15. REAL TIME DELAY	16. PURPOSE AND/OR REMARKS		
						A. VALUE	B. CLASS				
1	A	Orbital Elements		NA		Best Obtainable	II	*NET	<p>Classical orbital elements: apogee and perigee in nm and tenths; inclination in degrees and hundredths; period in minutes; and eccentricity. Orbital elements are to be based on the best range electronic position data through SECO and/or DIGS telemetry data. A nominal third stage thrust performance will be used for these calculations. Computations to be based on official NASA Spheroid (Fischer).</p> <p>NOTE: Final vehicle weights and revised second stage impact will be provided to the Range by F-3 days for use in orbital element calculations.</p> <p>* Send VIA TTY to: GUNV, GOPS, GPHY, GPOB, GCPN</p>		

(PAGE TITLE) METRIC TERMINAL DATA						2. REPLACES PAGE (S) DATED		3. PAGE NO. 2114 60		
5. PROGRAM TITLE DELTA IMP						6. PROGRAM NO. 2509		4. DATE 10 June 72		
8. ITEM NO		9. TEST CODE	10. DATA REQUIRED	11. INTERVAL (RANGE-ALT.-TIME)	12. DATA POINTS/SEC	13. DATA PRIORITY	14. DATA ACCURACY A. VALUE B. CLASS		15. REAL TIME RELAY	16. PURPOSE AND/OR REMARKS
1	A	First stage vacuum impact point; also vacuum miss-distance from nominal IP.	NA	NA	NA		+1.0 nm	II		Vacuum coordinates (plus surface range from launcher) to be given with associated error ellipse. Surface range (nm) may be given in Final Flight Report.
2	A	Second stage vacuum impact point; also vacuum miss-distance from nominal IP.	NA	NA	NA		+1.0 nm	II		(Note: Final IP is desired using radar tracking data taken after 3rd stage separation).

2. REPLACES PAGE (S)		3. PAGE NO.
DATED		4. DATE
5. PROGRAM TITLE		6. PROGRAM NO.
7. REVISION NO.		8. PAGE NO.

1. CLASSIFICATION		2. REPLACES PAGE (S)	3. PAGE NO.
OTHER METRIC DATA		DATED	4. DATE
5. PROGRAM TITLE		6. PROGRAM NO.	7. REVISION NO.
DELTA IMP		2509	2116 61

8. ITEM NO.	9. TEST CODE	10.
1	A	Best estimates of position and velocity trajectories (BET) are to be supplied as final data.
2	A	Two blue-line prints of each present position and IIP chart displayed at Central Control are required
3	A	All Delta Vehicles A two-minute period of RF silence on C-band radars is highly desired after the vehicle beacon is turned on to allow warmup without interrogation. It is requested that the two-minute silence be maintained unless a scheduling conflict exists which makes it necessary to operate radars during this period. The SRO is requested to advise BH 17 if this silence cannot be maintained.
4	A	ARCPE (TOC) instruction message distribution is required as follows: (a) Radar handover and phasing instructions: TTY to GNNS, GCEN/NOM, GBDA/STADIR.* (b) All other messages applicable to GSFC: TTY to GNNS and GCEN/NOM/NSM (c) One copy of all messages to: GCPN/LL-OPN-3, Norman. (d) One copy of all messages to: GKSC/TS-NTS-1.
5	A	One copy of the ADASP printout is required on launch +2 WD, mailed to LL-MLV.

* Handover and phasing instructions should be sent prior to F-1 day.

4. PAGE TITLE TELEMETRY DATA			2. REPLACES PAGE (S)	3. PAGE NO. 2200 62
			DATED	10 June 72
5. PROGRAM TITLE DELTA IMP	8. ITEM NO.	9. TEST CODE	6. PROGRAM NO. 2509	7. REVISION NO.

10.

LAND BASED TELEMETRY SUPPORT WILL BE LIMITED TO AFETR STATIONS AT ANTIGUA (ANT) AND ASCENSION (ASC). NO REQUIREMENT CONTAINED IN THIS DOCUMENT WILL BE INTERPRETED TO REQUIRE ANY OTHER SUPPORT.

GENERAL REMARKS

1. The Range User can use and will accept either 1-inch, 14 track or 1/2-inch, 7 track magnetic tapes, recorded either pre-detection or post-detection at the convenience of the Range. All post-detection recordings are to be made in a constant current recording mode. Pre-detection recording is preferred, but due to the reimbursable nature of the majority of Delta launches, the lowest cost system should be used.
2. Recordings will be required from all AFETR participating stations.
3. Tape format will be selected by Range Contractor Operations Planning with the approval of the RU (Mackey, 3-9353).
4. Signal strength, azimuth, elevation, and time to be recorded on the same pen recording.
5. Downrange Tracking Priority-Telemetry: On missions where the spacecraft, Stage 3, and Stage 2 telemetry systems are all radiating, the prime tracking frequency for the telemetry antennas prior to 3rd stage separation should be the Stage 2 telemetry signal (2241.5 MHz). After second stage-third stage separation, the third stage signal (256.2MHz) will be prime. On missions where the spacecraft and third stage are not radiating a telemetry signal during launch phase, track should be maintained on the Stage 2 signal. In all cases, a backup system for Stage 2 coverage after separation should be employed if available. Additional links, if flown, will be specified.
6. It is required to return the PCM data on VCO G, Stage 2, and the PDM data, VCO E, Stage 2 to Hangar AE from Antigua in Real Time. Upon final determination of channel assignments for the IMP-H mission, a list of the channels in addition to VCO E and G to be returned to AE will be provided. Selected channels of third stage data will also be returned.
7. Delete the first motion signal on the timing track of all vehicle telemetry tapes.
8. All magnetic tapes are required to be on reels with precision hubs rather than the standard hubs.
9. Doppler data is required from those stations viewing third stage burn.

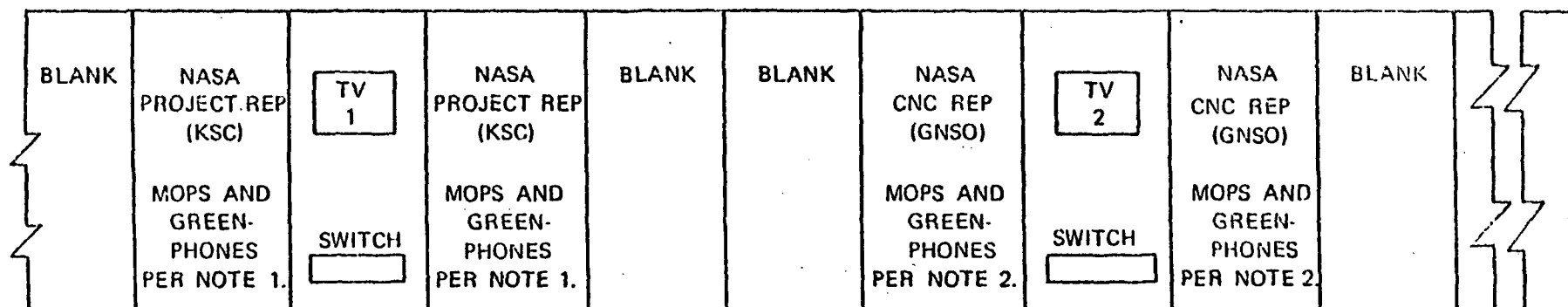
(PAGE TITLE) TELEMETRY DATA			2. REPLACES PAGE (S) DATED		3. PAGE NO. 2200.1 63	
5. PROGRAM TITLE DELTA IMP			8. ITEM NO.	9. TEST CODE	4. DATE 10 June 72	
				6. PROGRAM NO. 2509	7. REVISION NO.	
<p>10. In order to assist in the determination of success or failure of a mission, and to assist in prediction of preliminary orbital parameters, the verification and time of occurrence of Stage 3 spinup and separation are desired. Whenever the launch look angles indicate that the event will occur after passage of the launch vehicle over the Station 1 radio horizon, or that the data from Station 1 will be marginal due to low aspect angle or low signal strength, the data should be received at a downrange site, normally Station 91.</p> <p>This data should be recorded at the site on magnetic tape and on a direct write recorder for immediate readout by Range Contractor personnel. In addition, this data and selected PDM channels should be retransmitted in real time via the SSB link, or subcable, to Station 1 (Hgr AE) for display and readout by project personnel at that site.</p> <p>Four items of information are desired: Occurrence of the events; time of spinup indication; time of separation indication; and general quality of the data at these times.</p> <p>These times of spinup and separation should be reported as accurately as possible, but at least to within 1/2 seconds (preferably 0.1 sec) in Zulu time. Any real-time recordings run for this purpose should not be stopped, but should continue to run to preclude any possibility of stopping on an erroneous indication and missing the real events. A copy of these recordings should be supplied to the project.</p> <p>For additional information, the times of spinup command and separation command (as opposed to the actual function, previously mentioned) should be recorded for backup.</p> <p>For real-time retransmission of Stage 2 PDM on VCO E, it should not deviate more than $\pm 10\%$ on the wide band sub-cable.</p> <p>Telemetry assignments and Wave Forms will be supplied when available.</p>						

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(PAGE TITLE) COMMUNICATIONS - GENERAL			2. REPLACES PAGE (S)		3. PAGE NO. 2700 64	
5. PROGRAM TITLE DELTA IMP			6. ITEM NO.		7. DATE 10 June 72	
8. TEST CODE			9. PROGRAM NO. 2509		7. REVISION NO.	

10.

NASA PROJECT CONSOLE REQUIREMENTS FOR THE RANGE CONTROL CENTER (CENTER BAY REQUIRED)



FRONT ROW

NOTE 1:

MOPS CHANNELS REQUIRED:
LOOPS 1, 5, 11, 14, 15, 16,
AND 17, MONITOR OF SRO/
BH 17 GREENPHONE, AND
MSFN COORD.

GREENPHONES REQUIRED TO:
BH 17, CKFF, RCO, AND SRO
AND ALSO MOST REQUIREMENTS.

NOTE 2:

MOPS CHANNELS REQUIRED TO: CX 17 LOOPS
1, 2, 11, AND 15 AS WELL AS GSFC FULL
PERIOD 3, GSFC FULL PERIOD 6, MSFN CONF
CKT, MSFN RDR HANDOVER NET, MSFN COORD
NET, AND LAUNCH STATUS NET (SEE OR 3330
FOR DETAILS).

GREENPHONES REQUIRED TO: AE-MDAC
(OR 3310), AE-TLM LAB (OR 3310), STS (OR 3320),
AND RCO.

(PAGE TITLE) GROUND COMMUNICATIONS - DETAIL BROAD BAND DATA					2. REPLACES PAGE (S)			3. PAGE NO. 2710 65				
					DATED			4. DATE 10 June 72				
5. PROGRAM TITLE DELTA IMP					6. PROGRAM NO. 2510			7. REVISION NO.				
8. ITEM NO.	9. TEST CODE	10. USE		11. TYPE OF SERVICE	12. QTY	13. LOCATION OF OPERATING TERMINALS						14. PURPOSE AND REMARKS
		A. ADMIN	C. OPS			FROM			TO			
						A. STA	B. BLDG	C. RM	A. STA	B. BLDG	C. RM	
1	A,G		x	DATA CIRCUIT	1	Cx 17	BH			AE	125	BROAD BAND DATA CIRCUIT. S/C CONSOLE TO HGR AE. CABLE FROM CONSOLE TO POTHEAD 754E OR EQUIVALENT. MULTIPLIED TM DATA. CIRCUITS 1 TL 035 & 1 TL 036. 600 MHz. 4.5 MHz ITEMS 1 & 2 TO BE OPERATIONAL 15 JULY 72 THROUGH IMP-H LAUNCH
2	A,G		x	DATA CIRCUIT 75 OHM EQUALIZED	2	Cx 17	BH			AE	125	

1. (PAGE TITLE)										2. REPLACES PAGE (S)										3. PAGE NO.																
GROUND COMMUNICATIONS - INTERCOMMUNICATIONS SYSTEMS										DATED										4. DATE																
5. PROGRAM TITLE										9. TEST CODE										6. PROGRAM NO.																
DELTA IMP																				2509																
7. REVISION NO.																																				
ITEM NO.	TYPE	INST	NET TITLE OR NUMBER	A	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	REFERENCE NOTES				
					Test Conductor	Loop 2	Paging	Loop 4	Loop 5	Loop 6	Loop 7	Loop 8	Loop 9	Loop 10	Loop 11	Spacecraft 1	Spacecraft 2	Eye-ball	SNO	NASA Test Con	Project NASA	Loop 18	Spacecraft 3	Unassigned												
				B																																
				A																																
1			Complex 17 - BH		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
2			Launch Pad 17A - Cx 17		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
3			Launch Pad 17B - Cx 17		X	X		X		X	X	X	X	X	X	X	X	X	X				X	X												
4			Open																																	
5			M4 Area (M Annex) *		X	X	X	X	X	X	X	X			X	X	X		X																	
6			Patch Board - AE		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
7			ESO Observer (Eye-ball) - RCC		X	X							X						X	X		X														
8			Project Console - RCC		X				X				X		X	X		X	X	X	X															
9			VIP Room - RCC		M	M			M	M									M																	
10			Deleted																																	
11			ESO Bldg, Stations 54 & 55 - 227 & 231		X	X			X	X					X																					
12			Spin Test Facility (New)		X	X											X	X																		
13			Roadblock 8W		X																															
14			Space Operations Bldg - Cx 17		X	X	X	X	X	X	X	X	X	X	X	X	X																			

*Monitor area only on nets 3 thru 11 thru 13, and 15.

M = Monitor only

Local loops as installed (Hangar AE, M, M4, and SC vans) are required at Hangar AE patch board.

A communications technician is required in BH 17 from beginning of launch countdown through test termination.

(PAGE TITLE)

GROUND COMMUNICATIONS - INTERCOMMUNICATIONS SYSTEMS

2. REPLACES PAGE (5)

3. PAGE NO. 2740.1

67

DATED

4. DATE 10 June 72

3. PROGRAM TITLE.

DELTA IMP

9. TEST CODE

6. PROGRAM NO.	2509
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7. REVISION NO.

[illegible]

1. (PAGE TITLE)					2. REPLACES PAGE (S)		3. PAGE NO.				
COMMUNICATIONS RECORDINGS					DATED		4. DATE				
5. PROGRAM TITLE					6. PROGRAM NO.		7. REVISION NO.				
DELTA IMP					2509						
3. ITEM NO.	9. TEST CODE	10. STATION OR LOCATION	11. RECORDING REQUIREMENTS	12. AUDIO/VIDEO RECORDING					13. TIME CORRL		14. REMARKS
				A. START	B. STOP	C. A/V	D. SPEED	E. REEL SIZE	A. YES	B. NO	
1	A	Sta 1	MOPS Channel 1	Items are to be recorded from the beginning of the RU count to test termination unless noted.					X		1/4-inch magnetic tape, recorded at 1-7/8 ips. Disposition: Hold for 45 days or deliver to LL-MLV-1 upon request only. NOTE 1: Request all recordings be made with a voice operated relay (VOR) and that Zulu time be provided every 10 minutes.
2	A	Sta 1	MOPS Channel 2						X		
3	A	Sta 1	MOPS Channel 15						X		
4	A	Sta 1	MOPS Channel 17						X		
5	A	Sta 1	SRO to TC Greenphone						X		
6	A	Sta 1	Open						X		
7	A	Sta 1	NASA Project Console/BH 17 Program						X		
8	A	Sta 1	NASA Project Console/SRO Greenphone						X		
9	A	Sta 1	MOPS Channel 5	0-45	T+30				X		
10	A	Sta 1	MOPS Channel 6	0-45	T+30				X		

FORM R 222
JULY 70

1. CLASSIFICATION

(PAGE TITLE) GROUND COMMUNICATIONS - TELEPHONE (GREENPHONE)										2. REPLACES PAGE (S)		3. PAGE NO. 2780 69	
										DATED		4. DATE 10 June 72	
5. PROGRAM TITLE DELTA IMP										6. PROGRAM NO. 2509		7. REVISION NO.	
8. ITEM NO.	9. TEST CODE	10. TYPE	11. NUMBER			12. LOCATION				13. PURPOSE AND REMARKS			
			A. CL	B. LINE	C. EXT	A. STATION	B. BLOC	C. ROOM	D. OTHER				
1	A	Ops				1	CC	Proj	SRO Central Control	NASA Project Console			
2	A,G	Ops				1	CC	SRO	BH 17 Prime Station to Test Controller & Test Conductor Consoles	Test Coordination. This greenphone to be connected to NASA Project Central Consoles for monitor only (Test Code A only)			
3	A	Ops				1	BH 17	Adv	NASA Project Console at Central Control				
4	A	Ops				1	CC	Proj	Primary RSO Range Safety Console, Central Control	Test Coordination			
5	C	Ops				1	Area	39	Cape Dispensary	Required on a continuous basis			
6	C	Ops				1	Mark	IV	Cape Dispensary	Required on a continuous basis			
7	A	Ops				1	CC	Proj	Weather Officer	Test Coordination			
8	A	Ops				1	CC	Proj	Chief SRO	Test Coordination			

FORM R 231
JULY 70

1. CLASSIFICATION

(PAGE TITLE) GROUND COMMUNICATIONS - TELEPHONE (GREENPHONE)						2. REPLACES PAGE (S)		3. PAGE NO. 2780.1 70			
5. PROGRAM TITLE DELTA IMP						6. PROGRAM NO. 2509		4. DATE 10 June 72			
8. ITEM NO.		9. TEST CODE	10. TYPE	11. NUMBER A. CL B. LINE C. EXT		12. LOCATION A. STATION B. BLOC C. ROOM D. OTHER				13. PURPOSE AND REMARKS	
9		A	Ops			1		BH 17	Adv	Bldg AE, Rm 125	Test Coordination (5GP0750 existing)
10		A	Ops			1		BH 17	Adv	Bldg AE, Rm 125	Test Coordination (2GP0149 existing)
11		A	Ops			1		CC	Proj	RCO	Test Coordination

FORM R 231
JULY 70

1. CLASSIFICATION

1. CLASSIFICATION _____

(PAGE TITLE) TELEVISION					2. REPLACES PAGE (5)		3. PAGE NO. 2305 71	
					DATED		4. DATE 10 June 72	
5. PROGRAM TITLE DELTA IMP					6. PROGRAM NO. 2509		7. REVISION NO.	
8. ITEM NO.	9. TEST CODE	10. TYPE EQUIPMENT	11. SUBJECT TO BE VIEWED	12. LOCATION	13. PERIOD	14. PURPOSE AND REMARKS		
1	A,		Pad 17, CCTV	As Installed	Major Tests	CCTV as installed to be maintained by AFETR. Standby M&O personnel to advise MDAC TC of presence at S-30 of major tests and to stand by until released by SRO.		

FORM R 232
JULY 70

1. CLASSIFICATION _____

(PAGE TITLE) TIMING										2. REPLACES PAGE (S)		3. PAGE NO. 2810 72				
										DATED		4. DATE 10 June 72				
5. PROGRAM TITLE DELTA IMP										6. PROGRAM NO. 2509		7. REVISION NO.				
8. ITEM NO.	9. TEST CODE	10. TIMING SIGNAL		11. LOCATION OF END INSTRUMENT						12. REQ AGENCY RECORDING INSTRUMENT OR DUPLICER						13. REMARKS
		A. TIMING CODE HEP RATES	B. CORREL ACC	A. STA	B. BLDG NO.	C. ROOM NO.	D. HACK NO.	E. AMB TEMP	F. SPACE AVAIL	A. QTY	B. TYPE AND MODEL	C. SPEED IPS	D. INPUT VOLT	E. INPUT OHM	F. FREQ RESP	
1	A,G	D1	2 ms	1	BH17			75		1	1 Ampex 7&Ampex 14 track tape recorder	60	1.23	100K	100 to 100 kHz	
2	A,G	B1	10 ms	1	BH17			75		10	Westronic 2 channel pen re- corder	152 or 10	90	6800	DC to 100 pps	
3	A,G	B1	10 ms	1	BH17			75		1	Brush 40 channel pen recorder	5	28	200	0-60	
4	A,G	AMR B1	2	1	17A Svc Twr	7th level		75		1	Brush 14-3610-10 (100 Channel)	.08- .4	5max	27K	DC to 100 Hz	Provision for two timing signal outputs is required in the 7th level room.

1. CLASSIFICATION

1. CLASSIFICATION

(PAGE TITLE) SEQUENCER				2. REPLACES PAGE (S)		3. PAGE NO. 2020 73						
				DATED		4. DATE 10 June 72						
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.						
8. ITEM NO	9. TEST CODE	10. EVENTS		11. SIGNAL SEQUENCE		12. ELECTRICAL CHARACTERISTICS						
		A. AUTOMATIC FUNCTIONS CONTROL CIRCUITS	B. AUTOMATIC HOLD FIRE CIRCUITS	A. START FROM LO	B. STOP FROM LO	A. CHTS QTY M S			D. VOLTS	E. AMPS	F. DC OR CTS	
1	A	Used for keeping range time, initiating liftoff signal, providing hold-fire capability, and starting remote cameras.	A separate manual hold-fire capability is required for each of the following: (a) Test Controller (NASA) (b) Test Conductor (MDAC)	-90 min	+10 min							
13. REMARKS NOTE: 1. Sequencer to be wired to permit the sequencer digital count to stay at T-0 and start the plus count by launcher liftoff switch initiation. It is mandatory that the launch enable circuit be continuously energized during this period. A switching capability is required to permit selection of this mode of operation or a mode of permitting the sequencer digital count to continue to run at T-0 in lieu of pausing for the liftoff signal for go-ahead. 2. In order to launch the Delta vehicle within 200 ms of a pre-selected clock time, the Complex 17 Blockhouse sequencer must have the capability of starting the T-35 min terminal count (or later) within 200 ms of a pre-selected clock time if the Range is given a minimum of 5 min notice.												

 FORM R 234
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1. CLASSIFICATION

(PAGE TITLE) VISUAL COUNTDOWN AND STATUS INDICATORS										2. REPLACES PAGE (S)		3. PAGE NO. 2830				74	
										DATED		4. DATE 10 June 72					
5. PROGRAM TITLE DELTA IMP										6. PROGRAM NO. 2509		7. REVISION NO.					
8. ITEM NO.	9. TEST CODE	10. INFORMATION TO BE DISPLAYED	11. OPER PER FROM		12. OPER PER TO		13. OPER PER TOTAL		14. INDICATORS		15. LOCATION OF VISUAL INDICATORS				16. REMARKS		
			A. MIN	B. SEC	A. MIN	B. SEC	A. MIN	B. SEC	A. QTY	B. MTG	A. STA	B. BLDG	C. RM	D. LOCATION			
1	A,G	Range Countdown							8	P&B	1	BH17			As installed		
2	A,G	Blockhouse Sequencer							1		1	BH17			As installed		
3	A,G	Status (Hold-fire) Indication:															
		(a) SRO							1	P	1	BH17			As installed		
		(b) RSO							1	P	1	BH17			As installed BH17 Apex		
		(c) PSO							1	P	1	BH17			As installed (Console)		
		(d) TC							1	P	1	BH17			As installed		
4	A,G	Digital Clock							1	P or B	1	BH17	Apex		As installed		
NOTE 1: Countdown indicators to operate from begining of RU count pick up to test termination.																	

1. CLASSIFICATION _____

(PAGE TITLE) METEOROLOGICAL - FORECASTS				2. REPLACES PAGE (S) DATED _____		3. PAGE NO. 3220 75	
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.	
8. ITEM NO.	9. TEST CODE	10. TIME REQUIRED	11. FORECAST PARAMETERS (TYPE DATA, SURFACE, UPPER AIR, ALTITUDE, INTERVAL)	12. VALID TIME	13. LOCATION	14. PURPOSE AND REMARKS	
1	A	F-2 Days	Forecast of F-1 day and launch weather conditions, cloud cover, visibility, surface winds, winds aloft, temperature, and precipitation conditions.	T-0 for F-1 and F-0 day and present	Launcher	Ascertain ability to conduct F-1 day count-down and to launch. The forecast is to be telephoned to the Delta Operations Office, 853-6533.	
2	A	F-1 Day	Confirm or modify F-2 day forecast. Also wind velocity and direction in 1,000-ft increments to 60,000 ft.	T-0 and present	Launcher	Ascertain ability to launch. To be telephoned to the NASA-Delta Operations Office, 853-6533.	
3	A	T-10 Hr	Confirm or modify F-2 day forecast. Also wind velocity and direction in 1,000-ft increments to 60,000 ft.	T-0 and present	Launcher	Required only if winds appear abnormally high and large wind shears exist. To be phoned to Blockhouse 17, 853-7511.	
4	A	T-4 Hr	Same as Item 3.			This is to be a forecast based on the observation noted on Page 3230, Item 7.	
5	A	T-4 Hr	It is requested that a weather officer be on station at T-4 hr.				
6	A	F-4 Days	Long range general weather forecast for surface and predicted upper air winds for launch.	T-0	CKAFS	For Friday prelaunch planning and scheduling of weekend work. Long range forecast to be called to the Delta Operation Office by 0900 EST on the Friday before a normal Wednesday launch schedule.	
7	A	As Req'd	Forecast of surface conditions (wind velocity, precipitation, and lightning).	During S/C move (4-6 hr duration)	CKAFS	To ascertain feasibility of transporting S/C between checkout areas to launch pad, etc. The S/C coordinator will call 24 hr in advance.	

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1. CLASSIFICATION _____

1. CLASSIFICATION

1. (PAGE TITLE) METEOROLOGICAL - OBSERVATIONS								2. REPLACES PAGE (S)		3. PAGE NO. 3230 76		
								DATED		4. DATE 10 June 1972		
5. PROGRAM TITLE DELTA IMP								6. PROGRAM NO. 2509		7. REVISION NO.		
9. ITEM NO	10. TEST CODE	11. DATA REQUIRED	12. SURFACE		13. UPPER AIR			14. DATA PRIORITY	15. DATA ACCURACY		16. PURPOSE AND REMARKS	
			A. TIME-MIN	B. LOCATION	A. TIME-HR	B. LOCATION	C. INTERVAL		D. ALT-K FT	A. VALUE		B. CLASS
1	A	Pressure			T-0	Launch		110		2% to 50K 5% to 80K 10% above	III	Provide information for system evaluation analysis of trajectory deviations. Mag tape also required.
2	A	Temp			T-0	Launch		110		3°F to 40K, 10°F above	III	Same as item 1.
3	A	Wind	T-0	Launch	T-0	Launch		110		10 ft/sec vel, 5° direction*	II	Same as item 1.
4	A	Density	T-0	Launch	T-0	Launch		110		Calculated	III	Same as item 1.
5	A	Humidity	T-0	Launch				20		10%		
6	A	Pressure	T-0	Launch								
7a	A	Rawinsonde Obs			T-56 or > 44 T-29 or ≥ 23 T-15 or ≥ 12	Launch	1000 ft	60		See Notes 1 & 5	III	NOTES: 1. Wind direction to nearest degree, velocity to nearest knot, pressure to nearest millibar, and temperature to the nearest tenth of one degree Centigrade.

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(Approx)

1. CLASSIFICATION

1. CLASSIFICATION

(PAGE TITLE) METEOROLOGICAL - OBSERVATIONS									2. REPLACES PAGE (S) DATED		3. PAGE NO. 3230.1 77	
3. PROGRAM TITLE DELTA IMP									6. PROGRAM NO. 2509		7. REVISION NO.	
4. ITEM NO	5. TEST CODE	10. DATA REQUIRED	11. SURFACE		12. UPPER AIR				13. DATA PRIORITY	14. DATA ACCURACY		15. PURPOSE AND REMARKS
			A. TIME-HR	B. LOCATION	A. TIME-HR	B. LOCATION	C. INTERVAL	D. ALT-K FT		A. VALUE	B. CLASS	
7b	A	Wind-sonde or Rawin-sonde Obs.			Standard balloons acceptable T-8 or \geq T-7	Launch	1000 ft	60		See Notes 2 & 5	II	NOTES: (contd) 2. Pressure and temperature not required. (Wind-sonde observation is acceptable.) 3. Items 7a through 7c will be transmitted via commercial line to 1050 data phone at DAC Culver City. Call originated by DAC. 4. For all balloon releases scheduled for T-24 hr through launch a wind vs altitude plot is required on request. 5. DATA CARD FORMAT 1S: Wind Azimuth/ Velocity - (Card
7c	A	Wind-sonde or Rawin-sonde Obs.			T-3	Launch	1000 ft	60		See Notes 2 & 5	II	

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Set 1)

1. CLASSIFICATION

1. CLASSIFICATION _____

(PAGE TITLE) METEOROLOGICAL - OBSERVATIONS									2. REPLACES PAGE (S) DATED _____		3. PAGE NO. 3230.2 78	
5. PROGRAM TITLE DELTA IMP									6. PROGRAM NO. 2509		7. REVISION NO.	
8. ITEM NO	9. TEST CODE	10. DATA REQUIRED	11. SURFACE		12. UPPER AIR				13. DATA PRIORITY	14. DATA ACCURACY		15. PURPOSE AND REMARKS
			A. TIME-MN	B. LOCATION	A. TIME-MN	B. LOCATION	C. INTERVAL	D. ALT-K FT		A. VALUE	B. CLASS	
												NOTES: (Contd) A2MSPD---A2MSPD 01 XXXXXX---XXXXXX 80 1 72 Pressure in millibar (Card Set 2) PRES---PRES 07 XXXX---XXXX 80 1 72 Temperature - (Card Set 3) TEMP---TEMP 11 -XXX -XXX 80 1 72 Missing data indicated by four 9's. Positive temperature not punched. 6. Reduced rawinsonde or windsonde data from Items 7a through 7c is to

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1. CLASSIFICATION _____

1. CLASSIFICATION _____

(PAGE TITLE) METEOROLOGICAL - OBSERVATIONS									2. REPLACES PAGE (S)		3. PAGE NO. 3230.2 79	
									DATED		4. DATE 10 June 1972	
5. PROGRAM TITLE DELTA IMP									6. PROGRAM NO. 2509		7. REVISION NO.	
8. ITEM NO	9. TEST CODE	10. DATA REQUIRED	11. SURFACE		12. UPPER AIR				13. DATA PRIORITY	14. DATA ACCURACY		15. PURPOSE AND REMARKS
			A. TIME-MIN	B. LOCATION	A. TIME-hr	B. LOCATION	C. INTERVAL	D. ALT-K FT		A. VALUE	U. CLASS	
8	A	Wind			Cont from F-2 Day	Launch	100 ft.	110		10 fps vel, 5° direction	II	NOTES: (contd) 6. be forwarded to Hgr AE, Rm 102A, addressee: CAPCAN, Circuit NS-502 (identified as Mini-track circuit). One tab copy of each regularly scheduled synoptic rawinsonde sounding is required from F-2 Day until launch. Forward reduced synoptic rawinsonde data to Hgr AE, Rm 102A, addressee CAPCAN, Circuit NS-502 (identified as Minitrack circuit.)

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1. CLASSIFICATION _____

(PAGE TITLE) METEOROLOGICAL - OBSERVATIONS									2. REPLACES PAGE (S)		3. PAGE NO. 3230.4 80	
									DATED		4. DATE 10 June 72	
5. PROGRAM TITLE DELTA IMP									6. PROGRAM NO. 2509		7. REVISION NO.	
8. ITEM NO	9. TEST CODE	10. DATA REQUIRED	11. SURFACE		12. UPPER AIR				13. DATA PRIORITY	14. DATA ACCURACY		15. PURPOSE AND REMARKS
			A. TIME-MIN	B. LOCATION	A. TIME-MIN	B. LOCATION	C. INTERVAL	D. ALT-K FT		A. VALUE	B. CLASS	
9	A	Rotated upper winds	F-5 Day thru launch		On request	Launch	1000ft	60,000			II	Data is required (on request only) of regularly scheduled rawinsonde or special windsonde balloon releases rotated to the specific azimuth that Range Safety furnishes the weather group by F-5 Days for each particular launch.
10	A	Temp, Barometric Pressure, Relative Humidity	F-0 Day	Cx 17								Data is required (on request only) at the start of first stage fuel tanking on F-0 Day.

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(PAGE TITLE)		2. REPLACES PAGE (S)	3. PAGE NO.
CONSULTANT SERVICES			3260 81
3. PROGRAM TITLE		DATED	4. DATE
DELTA IMP		5. PROGRAM NO.	10 June 1972
		2509	7. REVISION NO.
6. ITEM NO.	7. TEST CODE	10.	
1		Severe weather warnings must be called to Pad 17 Operations (853-7511) when a vehicle is on the launch pad.	
2	A	<p>Consideration will be given to the following GO/NO-GO criteria for launch relative to lightning strike potential:</p> <ol style="list-style-type: none"> 1. No launch when flight will go through cumulonimbus (thunderstorm) cloud formation. In addition, no launch if flight will be within 5 miles of thunderstorm cloud or 3 miles of associated anvil. 2. No launch through cold-front or squall-line clouds which extend above 10,000 feet. 3. No launch through middle cloud layers 6,000 feet or greater in depth where the freeze level is in the clouds. 4. No launch through cumulus clouds with tops at 10,000 feet or higher. <p>During the launch countdown, it is required that AFETR weather personnel evaluate the GO/NO-GO for launch based upon these criteria. These evaluations and/or recommendations are to be given to the Test Controller in BH 17 or his designated representative periodically or upon request. It should be recognized that circumstances may dictate waiver of these rules at the discretion of the launch agency.</p>	

FORM R G/A
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1. CLASSIFICATION _____

(PAGE TITLE) RECOVERY - SALVAGE AND DISPOSITION				2. REPLACES PAGE (S)		3. PAGE NO. 3330 82	
				DATED		4. DATE 10 June 72	
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.	
8. ITEM NO.	9. TEST CODE	10. NO. ENCLOSURE	11. WT - LBS	12. LOCATION	13. DESCRIPTION	14. PURPOSE AND REMARKS	
1	A	<u>1st Stage</u>				Parts required for engineering investigation and evaluation.	
		(a) Main and Vernier Engines and Related Components	2500	Base of first stage		Detailed instructions for parts recovery requirements will be issued by the Project Survey Board immediately after an incident:	
		(b) Main Propellant Tanks and Related Ducting	1000	Main portion of first stage		<u>First Stage</u>	
		(c) Telemetry Transmitters and Range Safety	250	Centaur section of first stage		(a) Engine components may contain flammable fuel; also, possibly gel for up to 10 hours.	
		(d) Missile Wiring, and J Boxes	200	Base, center, and forward section of first stage		(b) Base section and tunnels may contain live detonators and primacord.	
		(e) Thrust Augmenting Motors	59,000	Attached to first stage		(c) Batteries (center section) may leak corrosive fluid or supply sufficient power to cause arcing and sparking for up to five days.	
						(d) Thrust augmenting motors are solid propellants.	
						(e) Total of Six	

PAGE TITLE) RECOVERY - SALVAGE AND DISPOSITION					2. REPLACES PAGE (S)		3. PAGE NO. 3530.1 83	
5. PROGRAM TITLE DELTA IMP					6. PROGRAM NO. 2509		4. DATE 10 June 72	
7. REVISION NO.								
8. ITEM NO.	9. TEST CODE	10. NO. ENCLATURE	11. WT - LBS.	12. LOCATION	13. DESCRIPTION	14. PURPOSE AND REMARKS		
2	A	<u>2nd Stage</u>						
		(a) Main Engine and Components	500	Base of second stage		Second Stage (a) Engine components and tanks may contain hypergolic flammable and/or corrosive propellants.		
		(b) Tanks	200	Main portion of second stage		(b) Forward section may contain live separation squibs.		
3	A	(c) Guidance and Telemetry	500	Forward portion of second stage		(c) Batteries may leak corrosive fluid.		
		<u>3rd Stage</u>						
4	A	(a) Main Motor	Approx. 2400	Major portion of third stage		Third Stage (a) Main motor and spin motors are solid propellants.		
		(b) Spin Motors and Interstage	100	Forward portion of third stage		(b) Separation squibs cutters may be live.		
4	A	<u>Payload</u>		Entire payload assembly.		Contains small quantities of hazardous materials and solid propellant.		

1. CLASSIFICATION

(PAGE TITLE) OTHER TECHNICAL SUPPORT - AIRCRAFT					2. REPLACES PAGE (S)					3. PAGE NO. 3410 84									
					DATED					4. DATE 10 June 72									
5. PROGRAM TITLE DELTA IMP					9. TEST CODE A					6. PROGRAM NO. 2509					7. REVISION NO.				
8. ITEM NO.	10. AIRCRAFT SOURCE FUNCTION/ REQUIREMENT	11. EQUIPMENT TO INSTALLED IN AIRCRAFT	12. ITEM	13. NUMBER OF AIRCRAFT AND AIRCRAFT FLYING HOURS/QUARTER															
				FY 73				FY 74				FY				FY			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	ARIA	P&S Band Telemetry Received & Record	A NUMBER OF AIRCRAFT	1				1											
			B NO OF FLIGHTS/A/C																
			C FLIGHT HRS/TEST																
			D TOTAL FLYING HRS/QTR																
			E STATION																
			F FLIGHT PATH																
			G SPEED RANGE - KTS																
			H ALTITUDE - 1000 FT																
			A NUMBER OF AIRCRAFT																
			B NO. OF FLIGHTS/A/C																
			C FLIGHT HRS/TEST																
			D TOTAL FLYING HRS/QTR																
			E STATION																
			F FLIGHT PATH																
			G SPEED RANGE - KTS																
			H ALTITUDE - 1000 FT																
			A NUMBER OF AIRCRAFT																
			B NO. OF FLIGHTS/A/C																
			C FLIGHT HRS/TEST																
			D TOTAL FLYING HRS/QTR																
			E STATION																
			F FLIGHT PATH																
			G SPEED RANGE - KTS																
			H ALTITUDE - 1000 FT																
14. REMARKS COVER 3rd STAGE BURN AND S/C SEPARATION.																			

FORM R 316

JULY 70

1. CLASSIFICATION

1. CLASSIFICATION _____

(PAGE TITLE) MEDICAL - PERSONNEL - STANDBY			2. REPLACES PAGE (5) DATED _____		3. PAGE NO. 3520 85	
5. PROGRAM TITLE DELTA IMP			6. PROGRAM NO. 2509		4. DATE 10 June 1972	
8. ITEM NO.		9. TEST CODE	10. LOCATION	11. NUMBER/SPECIALTY	12. REMARKS/SPECIAL REQUIREMENTS	
1		A	Complex 17	2 Medical Technicians	F-1 Day and Launch. Start of countdown thru test termination or defueling. Ambulance and first aid service required at Complex 17. Ambulance is to report to MDAC pad operations (853-7511).	

FORM R 324
JULY 70

1. CLASSIFICATION _____

1. CLASSIFICATION _____

3. (PAGE TITLE) DATA PROCESSING AND DISPOSITION					2. REPLACES PAGE (S)		3. PAGE NO. 4200 86			
					DATED		4. DATE 10 June 1972			
5. PROGRAM TITLE DELTA IMP					6. PROGRAM NO. 2509		7. REVISION NO.			
8. ITEM NO.	9. TEST CODE	10. DATA TYPE	11. REFERENCE		12. DISTRIBUTION	13. QUANTITY		14. RECIPIENT	15. TIME REQD	16. REMARKS
			A. PAGE NO.	B. ITEM NO.		A. ORIG	B. CVS			
Will be provided in Revision 1.										

FORM R 404
JULY 70

1. CLASSIFICATION _____

1. CLASSIFICATION _____

(PAGE TITLE) PERSONNEL ASSIGNMENT SCHEDULES - DETAIL					2. REPLACES PAGE (5)					3. PAGE NO. 5110 - 87																	
5. PROGRAM TITLE DELTA IMP					8. ITEM NO.		9. TEST CODE A		6. PROGRAM NO. 2503					4. DATE 10 June 1972													
									7. REVISION NO.																		
10. LOCATION		11. PERSONNEL CATEGORY		12. NUMBER OF PERSONNEL ASSIGNED/ MONTH - QUARTER																							
				FY-73										FY					FY								
				CY - 74										CY					CY								
				J	A	S	O	N	D	J	F	M	A	M	J	1	2	3	4	1	2	3	4	1	2		
		A. CONTRACTOR (INCL SUB-CONTR.)																									
		ADMINISTRATIVE (MDAC)		20																							
		ENGINEERING (MDAC)		60																							
		TECHNICIAN (MDAC)		60																							
		B. CIVIL SERVICE																									
		ADMINISTRATIVE (JFKSC/ULO)		10																							
		ENGINEERING (JFKSC/ULO)		20																							
		TECHNICIAN																									
		C. MILITARY																									
		OFFICERS																									
		ENLISTED																									
		D. TRANSIENTS																									
		CONTRACTOR		30	30	30	30																				
		CIVIL SERVICE (GSFC)		15	15	15	15																				
		MILITARY																									
E. TOTAL																											
13. REMARKS																											

FORM R 500
JULY 70

1. CLASSIFICATION _____

2. REPLACES PAGE (S)		3. PAGE NO. 8310 88
DATED		4. DATE 10 June 72
5. PROGRAM TITLE DELTA IMP		6. PROGRAM NO. 2509
7. REVISION NO.		

8. ITEM NO.	9. TEST CODE	10.
1	A	<u>Fuels:</u> RJ-1 N204 and Aerozine 50 delivery to be scheduled so they are on hand in the launch complex area well in advance of the need time specified in the countdown. In addition, backup capability to support a rescheduled test within a 24-hour period is required.
2	A	<u>Liquid Gases:</u> Liquid oxygen and Liquid Nitrogen delivery to be scheduled so they are on hand in the launch complex area well in advance of the need time specified in the countdown. Complex tankage should be filled on F-1 day. Liquid oxygen will be available prior to F-1 day for propellant flow test. Liquid Nitrogen will be available for second stage Pneumatic System Qual Test.
3	A	<u>Hi-Pressure Gases:</u> Helium complex storage bottles are to be pressurized to 4,800 psi, and nitrogen complex storage bottles are to be pressurized to 5,500 psi on F-0 day. A gaseous nitrogen supply of approximately 41,000 scf at 2,400 psi (MH-2 tube bank trailer) is required to be permanently stationed at the following locations: (1) South side of Hangar M, Bldg 3-1731; (2) Adjacent to the North POL Bldg 3-1732A; (3) Two trailers adjacent to Bldg 60425; (4) Adjacent to Hangar M Annex, Bldg 55005. Two MH-2 tube tank trailers or equivalent are required at Complex 17 from F-7 day until launch. The particular pad will be in accordance with the launch schedule.
4	A	<u>Solid Propellants and Ordance Items:</u> Ordance items listed on the Ordance Item Page should be delivered to the launch complex area well in advance of the need time specified in the countdown. Certain ordance items are required prior to F-2 day. Spare Ordance will be provided at the complex by the Pan Am Solid Propellants Section.
5	A	<u>Water:</u> Demineralized water will be needed in the event of a misfire. The necessary chemicals are to be on hand on F-2 day.

FORM R G/A
JULY 70

(PAGE TITLE) SERVICES - VEHICLES AND GROUND HANDLING EQUIPMENT					2. REPLACES PAGE (S) DATED		3. PAGE NO. 5340 89							
5. PROGRAM TITLE DELTA IMP					9. TEST CODE 2509		6. PROGRAM NO.							
							7. REVISION NO.							
ITEM NO.	NAME OR NOMENCLATURE	CAPACITY	PURPOSE	13. USED	14. RA OR SA	15. NUMBER REQUIRED/QUARTER								16. REMARKS/SPECIAL INSTRUCTIONS
						FY				FY				
						CY				CY				
						1	2	3	4	1	2	3	4	
1	Tractor & Trailer, Full Flat Bed	5 ton	Transporting	On Call	SA	Continuous Requirement								*Eight each placed on the MST 8th level for 2nd stage fuel and oxidizer servicing. Two each are to be placed in the fuel and oxidizer trailers respectively. Units are to be provided on F-2 days for fueling and to stay on pad until launch termination. See launch schedule for use.
2	Truck, Swingboom	3/4 ton	Moving Instr & Shop Van	↑	↑			↑						
3	Tractor	2 ton	Moving Vans	↑	↑									
4	Truck Crane	6 ton	Misc Pad and Hangar	↑	↑									
5	Tug	10 ton	Missile Unloading	↑	↑									
6	Field Welding Van	30 amp	Tower DC Mod	↑	↑									
7	Tractor & Trailer, Low Bed	25 ton	Transporting	↑	↑									
8	Fork Lift	7500 lb	Equipment	↑	↑									
9	Fork Lift	2500 lb	Equipment Handling	↑	↑									
10	Fork Lift	15,000 lb	Heavy Equip Handling	↑	↑									
11	Crane	10 ton	Equip Handling	↑	↑									
12	Scott Air Packs*	12 ea	During Propellant Handling	↑	↑									
13	Dead weights	30,000 lb	Proof Test Tower Hoist	↑	↑									
14	A Frame	2000 lb	Manipulate 2nd Stage	↑	↑									
15	Tow Truck	2000 lb	Delivery 2nd Stage Servicing Trls to Pad	On Call	SA	Continuous Requirement								

1. CLASSIFICATION

(PAGE TITLE) SERVICES - VEHICLES AND GROUND HANDLING EQUIPMENT						2. REPLACES PAGE (S) DATED				3. PAGE NO. 5340.1 90					
5. PROGRAM TITLE: DELTA IMP						6. TEST CODE		8. PROGRAM NO. 2509				4. DATE 10 June 1972			
7. REVISION NO.															
9. ITEM NO.	10. NAME OR NOMENCLATURE	11. CAPACITY	12. PURPOSE	13. USE	14. RA OR SA	15. NUMBER REQUIRED/QUARTER								16. REMARKS/SPECIAL INSTRUCTIONS	
						FY				FY					
						1	2	3	4	1	2	3	4		
16	D7 or D8 Tractor with High Draw Winch or equal with rubber tires		Support Tower Removal	On Call	SA	Continuous Requirement								Tractor must be available at least two hours before tower removal. For hurricane preparation. Required just prior to and for duration of tower guy installation task. For hurricane preparation. Required just prior to and for duration of tower guy installation task. Continuous requirement after Condition II hurricane until All Clear. Continuous requirement after Condition II hurricane until All Clear. Continuous requirement after Condition II hurricane until All Clear. Available from MDAC Motor Pool.	
17	Bridge Crane	2 ton	Spin Test Bldg, Area 29	On Call	RA	Continuous Requirement									
18	M246 Military Hydraulic Crane with Telescopic Boom and Winch	45 ton	Support Tower Guy Cable Installation		SA										
19	100-Ft Boom Lorain Crane		Support Tower Guy Cable Installation		SA										
20	15-kW Generator, 115 V		To Power Sump Pumps, etc.		SA										
21	30-kW Generator, 480 V		To Power Sump Pumps, etc.		SA										
22	Portable Gasoline Powered Pump		To Aid in Water Removal as Required		SA										
23	F-800 Truck with Winch		Support Tower Guy Cable Installation		RA										

FORM R 505
JULY 70

1. CLASSIFICATION

1. CLASSIFICATION

(PAGE TITLE) CHEMICAL AND PHYSICAL ANALYSIS				2. REPLACES PAGE (S) DATED		3. PAGE NO. 5410 94 4. DATE 10 June 1972	
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.	
8. ITEM NO.	9. TEST CODE	10. NAME/DESIGNATION	11. MIL. SPEC. NO.	12. DETAILS OF ANALYSIS REQUIRED		13. SAMPLING TIMES	
1	A	RJ-1-Fuel	MIL-P-7254E, Type 111B	ANALYSIS REQUIRED (1) Distillation: (a) Initial Boiling Point (b) 10% (c) 50% (d) 90% (e) End Point (f) Residue (g) Loss (2) Color (3) Odor (4) Flash Point (5) Gravity, °API (6) Viscosity at 100° F (7) Freezing Point		REQUIRED SPECIFICATIONS (1) Distillation: (a) 430° F min (b) 480° F max (c) Not limited (d) 550° F max (e) 600° F max (f) 1.5% max (g) 1.0% max (2) Orange (3) Typical Hydrocarbon (4) 190° F min (5) 32.5° min - 36.5° max (6) 3.5 C's max (7) -40° F max	
2	A	Liquid Oxygen	MIL-P-25508B (USAF) Type II	ANALYSIS REQUIRED From Storage Tank & Vehicle (1) Purity (%O ₂) (2) Total Hydrocarbons		REQUIRED SPECIFICATIONS (1) 99.5% by vol min (2) 75 ppm max. (by weight as Methane)	
14. REMARKS							

FORM R 510
JULY 70

1. CLASSIFICATION

FORM R 510
JULY 70

(PAGE TITLE) CHEMICAL AND PHYSICAL ANALYSIS				2. REPLACES PAGE (S)		3. PAGE NO. 5410.2 93	
				DATED		4. DATE 10 June 1972	
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.	
8. ITEM NO.	9. TEST CODE	10. NAME/DESIGNATION	11. MIL. SPEC. NO.	12. DETAILS OF ANALYSIS REQUIRED		13. SAMPLING TIMES	
3	A	Liquid Nitrogen	MIL-P-27401 (USAF) Type II	ANALYSIS REQUIRED (1) Purity (%N ₂) (2) Total Hydrocarbons (3) Non-Volatile Hydrocarbons NOTE: Non-volatile hydrocarbons are those heavier hydrocarbons that will not normally flash off, but can be carried along in a flowing gas system. (4) Acetylene (5) Particle size and count the following micron ranges: 100-175, 175-700, 700+ (6) Water Content (7) Odor		REQUIRED SPECIFICATIONS (1) 99.5% by vol min (2) 75 ppm max (by weight as Methane) (3) 0.5 ppm max (by weight as N-Centane) (4) 1.5 ppm max (by weight) (5) No limits required. MDAC will make comparison with past results for abnormal conditions. (6) 0.02 mg/1 gas at 70° F, 760 mm Hg. (7) None. The absence of odor is required by MDAC.	
4	A	Aerozine 50	TBD			1. From liquid converter tank at least once a month. 2. From converter on F-1 day. 3. Results in 12 hr.	
5	A	N ₂ O ₄	TBD				
14. REMARKS							

(PAGE TITLE) CHEMICAL AND PHYSICAL ANALYSIS				2. REPLACES PAGE (S) DATED	3. PAGE NO. 5410.3 94 4. DATE 10 June 1972
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509	7. REVISION NO.

8. ITEM NO.	9. TEST CODE	10. NAME/DESIGNATION	11. MIL. SPEC. NO.	12. DETAILS OF ANALYSIS REQUIRED	13. SAMPLING TIMES	
6	A	Hydraulic Oil	MIL-H-5606B	<u>ANALYSIS REQUIRED</u> (1) Viscosity (2) Flash Point (3) Filtration (Millipore) Test Stands and Vehicle Systems/100M (4) Appearance	<u>REQUIRED SPECIFICATIONS</u> (1) 10-15 Cs at 130° F (2) 200° F min (3) Filtration (Millipore) 10-25 26-50 51-100 100+ 5570 570 110 24 (4) Red and Clear	1. As requested. Approximately one per week. 2. Results in 24 hr.
7	A	Oronite	MIL-L-25336	(1) Appearance (2) Viscosity (a) 210° F (b) 200° F (3) Flash Point	(1) Free from sediment and suspended matter. (2) Viscosity (a) Min 3.0 Cs (b) Min 11.0 Cs (3) Min 400° F	1. As requested and F-4 day. 2. Results in 24 hr.
8	A	Gaseous Nitrogen Evaporated from Liquid Nitrogen (Liquid Nitrogen Pumped)	MIL-P-27401	(1) Non-Volatile Hydrocarbons NOTE: Non-volatile hydrocarbons are those heavier hydrocarbons that will not normally flash off, but can be carried along in a flowing gas system.	(1) 0.5 ppm max (by weight as N-Cetane)	1. From High Pressure Area at least once a month. 2. F-4 day. 3. Results in 24 hr.
9	A	Gaseous Helium	Bureau of Mines (Grade A)	(1) Moisture	(1) 26.3 ppm (by vol)	1. From each storage bottle at least once a month or as requested.

14. REMARKS

FORM R 510
JULY 70

1. CLASSIFICATION _____

1. CLASSIFICATION _____

(PAGE TITLE) CHEMICAL AND PHYSICAL ANALYSIS				2. REPLACES PAGE (S)		3. PAGE NO. 5410.4 95	
				DATED		4. DATE 10 June 1972	
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.	
9. ITEM NO.	5. TEST CODE	10. NAME/DESIGNATION	11. MIL. SPEC. NO.	12. DETAILS OF ANALYSIS REQUIRED		13. SAMPLING TIMES	
9	A	Gaseous Helium (Contd)	Bureau of Mines (Grade A)	ANALYSIS REQUIRED REQUIRED SPECIFICATIONS (2) Non-Volatile Hydrocarbons (2) 0.5 ppm max (by weight as N-Cetane) NOTE: Non-volatile hydrocarbons are those heavier hydrocarbons that will not normally flash off, but can be carried along in a flowing gas system.		2. From each storage bottle on F-4 day. 3. Results in 24 hr.	
10	A	Demineralized Water	Commercial	(1) Appearance (1) Crystal clear and free of suspended matter. (2) Particles (2) No visible settling particles. (3) Total Solids (3) 10 ppm max. (4) Acidity (4) pH of 6.5 to 7.0 after boiling for 15 min. (5) Chloride (5) 4 ppm min or 10 ppm max by conductivity test after boiling 15 min.		1. As requested. 2. Results in 24 hr.	
11	A	Low Stabilized Trichloroethylene	RB0210-003	(1) Total Residue (1) 0.0020% by weight (2) Carbon Tetra-chloride Soluble Residue (2) 0.0002% by weight as Cetane. (3) Acidity (3) Greater than pH 6.5 (4) Amine Alkalinity (4) .002% by weight max (5) Nonamine Alkalinity (5) .0015% by weight min		1. From each batch prior to delivery to MDAC. 2. From Flush Cart on F-4 day. 3. Results required in 24 hr.	
14. REMARKS							
to .008% by wt max							

FORM R 510
JULY 70

1. CLASSIFICATION _____

1. CLASSIFICATION _____

(PAGE TITLE) CHEMICAL AND PHYSICAL ANALYSIS				2. REPLACES PAGE (S) DATED _____	3. PAGE NO. 5410.5 96 4. DATE 10 June 1972 7. REVISION NO. _____
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509	
8. ITEM NO.	9. TEST CODE	10. NAME/DESIGNATION	11. MIL. SPEC. NO.	12. DETAILS OF ANALYSIS REQUIRED	13. SAMPLING TIMES
12	A	Unknown Materials		Identification of Contaminants: Chemical Laboratory support is required to identify solid, liquid, or gaseous contaminants which may occur in propellants, flushes, hydraulics, lubricants, and their transport and storage systems for both the GSE and vehicle.	1. As required. Approx 1 per week. 2. Results in 24 hr.
13	A	Solvent Flushings		Analysis of Solvent Flushings: Chemical Laboratory support is required to determine the nature of contaminants as they occur in flushes, propellants, hydraulics, lubricants, and their transfer and storage systems for both the GSE and vehicle. The contaminants may consist of organic or inorganic materials and may be in particulate, liquid, or vapor form.	1. As required. Approx 3 per week. 2. Results in 12 to 48 hr.
14. REMARKS					

FORM R 510
JULY 70

1. CLASSIFICATION _____

1. CLASSIFICATION

(PAGE TITLE) FACILITIES - GENERAL										2. REPLACES PAGE (S)				3. PAGE NO. 5600 697								
										DATED				4. DATE 10 June 1972								
5. PROGRAM TITLE DELTA IMP										6. PROGRAM NO. 2509				7. REVISION NO.								
8. ITEM NO.	9. TEST CODE	10. LOC	11. TYPE OF FACILITY	12. SITE DESIRED	13. STA		14. SCHEDULE															
					ASSGND	NEW	CY-72				CY-73				CY-74				CY-75			
							FY-72		FY-73		FY-74		FY-75		FY-76							
							1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	A*		M Annex (Fac 55005) Administration General Support Technical Laboratories		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	A*		Missile Assembly Building (M) (3-1731) Laboratories Support Technical (AGC) Instr Assembly Area Tech (MDC)		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	A*		Operation Equip Storage Bldg (M-1) (3-1731A)		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	A*		Storage Bldg (M-2) (3-60510)		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15. REMARKS																						

FORM R 511
JULY 70

1. CLASSIFICATION

1. CLASSIFICATION _____

(PAGE TITLE) FACILITIES - GENERAL										2. REPLACES PAGE (S)					3. PAGE NO. 5600.1 98								
										DATED					4. DATE 10 June 1972								
5. PROGRAM TITLE DELTA IMP										6. PROGRAM NO. 2509					7. REVISION NO.								
8. ITEM NO.	9. TEST CODE	10. LOC	11. TYPE OF FACILITY	12. SITE DESIRED	13. STA			14. SCHEDULE															
					ASSGND	NEW	EXSTNG	CY-72				CY-73				CY-74				CY-75			
								FY-72		FY-73		FY-74		FY-75		FY-76							
								1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
5	A*		Warehouse (M-3) (3-60510)		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	A*		Operational Equip Storage Bldg (L-1) (3-1732B) Stockroom Receiving-Shipping Support		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	A*		Test Cells, High Pressure (L-3) (60425)		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	A*		Alignment and Spin Balance Bldg (Cx 3-4) (2841)		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9	A		Skid Strip		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10	A*		Launch Cx 17 (5-1270) Blockhouse (5-1270A) Launch Pads (5-1270B&C)		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15. REMARKS																							

FORM R 511
JULY 70

1. CLASSIFICATION _____

1. CLASSIFICATION _____

(PAGE TITLE) FACILITIES - GENERAL					2. REPLACES PAGE (S) DATED _____					3. PAGE NO. 5600.2 99														
5. PROGRAM TITLE DELTA IMP					6. PROGRAM NO. 2509					7. REVISION NO.														
8. ITEM NO.	9. TEST CODE	10. LOC	11. TYPE OF FACILITY	12. SITE DESIRED	13. STA AROUND NEW EXISTING		14. SCHEDULE																	
							CY-72				CY-73				CY-74				CY-75					
							FY-72		FY-73		FY-74		FY-75		FY-76									
							1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
10 (Cont)	A*		Shop (5-1270J) Ready Room (5-1270J) Engineering Office Service Tower (5-1270X & AA) LOX Storage and Transfer Facility (MDC 1832665 & 1734929) Fueling Facility (5-1270-AF) Helium and Nitrogen Facility (5-1270-K) Demineralized Water System (5-1270-L)																					
11			Deleted																					
15. REMARKS																								

FORM R 511
JULY 70

1. CLASSIFICATION _____

1. CLASSIFICATION

(PAGE TITLE) FACILITIES - GENERAL					2. REPLACES PAGE (S)					3. PAGE NO. 5600.3 100				
					DATED					4. DATE 10 June 1972				
5. PROGRAM TITLE DELTA IMP					6. PROGRAM NO. 2509					7. REVISION NO.				

9. ITEM NO.	10. TEST CODE	11. LOC	12. TYPE OF FACILITY	13. SITE DESIRED	14. STA		15. SCHEDULE																	
					ASGND	NEW	CY-72				CY-73				CY-74				CY-75					
							FY-72		FY-73		FY-74		FY-75		FY-76									
							1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
12	A		Hangar AE S/3000/100 S/1000/20 O 3000/50 S 2100/10 Pr 3000/100 T=38,000 sq ft	S/C Lab Tlr Pkg Engrg Ant Twr	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13			Open Item																					
14	A		Instrumentation Site	CKAFS	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	A		S 7500/10	X=638,400 Y=1,499,810																				
15			S 500/10 (reqd from F-30 working days)																					
16	A*		Space Operations Bldg 0/2142/34	Cx 17		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
17	A*		Trailer Parking Area S 1000/15	Cx 17	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
18	A		X-Ray Equipment	NDTL		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

16. REMARKS

FORM R 511
JULY 70

1. CLASSIFICATION

(PAGE TITLE) FACILITIES - GENERAL												2. REPLACES PAGE (S)				3. PAGE NO. 5800. 4 101			
												DATED				4. DATE 10 June 1972			
5. PROGRAM TITLE DELTA IMP												6. PROGRAM NO. 2509				7. REVISION NO.			

3. ITEM NO.	9. TEST CODE	10. LOC	11. TYPE OF FACILITY	12. SITE DESIRED	13. STA		14. SCHEDULE															
					D ASSG	NEW	CY-72				CY-73				CY-74				CY-75			
							FY-72		FY-73		FY-74		FY-75		FY-76							
							1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
19	A**		TAD Assembly Facility Assembly & Check-out (3,500 sq ft) Ready Service Bldg (3,500 sq ft)	Missile Checkout Bldg 67210 (Mark VI Bldg) Temporary	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20	A**		Alignment & Spin Balance Bldg 2 Replaces Item 8 Spin Test Bldg (2,300 sq ft) Control Bldg (1,000 sq ft)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	A**		Propellant Servicing System One fuel and one oxidizer servicing unit	Cx 17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

15. REMARKS

1. CLASSIFICATION

(PAGE TITLE) FACILITIES - GENERAL										2. REPLACES PAGE (S)				3. PAGE NO. 5600.5 102									
										DATED				4. DATE 10 June 1972									
5. PROGRAM TITLE DELTA IMP										6. PROGRAM NO. 2509				7. REVISION NO.									
8. ITEM NO.	9. TEST CODE	10. LOC	11. TYPE OF FACILITY	12. SITE DESIRED	13. STA			14. SCHEDULE															
					ASSGND	NEW	EXSTNG	CY-72				CY-73				CY-74				CY-75			
								FY-72		FY-73		FY-74		FY-75		FY-76							
								1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
22	A**		Fluid and Acid Storage Bldg (Integral with Facility 60425)	Hgr L	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23	A**		Solar Array Test Facility, Area 60, Bldg AM Vicinity (1,056 sq ft)	Adj to Bldg AM	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24	A		Storage Bldg ***	Hgr O (Rm 101, 102, 103, & 104)	X			X	X	X	X	X	X										
25	A		Storage Bldg***	Bldg 1402J	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26	A		Administration	E&O Bldg, Rm 227 thru 235 (Rm 200, 201, 202, & 214 are corusage with Centaur)	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15. REMARKS																							
NOTES: *NASA real property accountability; Range Contractor performing maintenance on a reimbursed basis. **Planned NASA real property accountability; Range Contractor performing maintenance on a reimbursed basis ***Assigned per memo agreement ETOOP-3 to NTSD: Subject: CKAFS TV Studio, dtd 19 Oct 65.																							

 FORM R 511
 JULY 70

1. CLASSIFICATION

1. CLASSIFICATION

(PAGE TITLE) FACILITIES - DRAWINGS			2. REPLACES PAGE (S) DATED		3. PAGE NO. 5810 103
5. PROGRAM TITLE DELTA IMP		8. ITEM NO.	9. TEST CODE	6. PROGRAM NO. 2509	4. DATE 10 June 1972
10. DRAWING <p style="text-align: center;">COMPLEX 17 (TYPICAL)</p>					11. REFERENCES (DRAWINGS)

FORM R 512
JULY 70

1. CLASSIFICATION

1. CLASSIFICATION

(PAGE TITLE) FACILITIES - LAUNCHER AND PLATFORM CHARACTERISTICS				2. REPLACES PAGE (S) DATED		3. PAGE NO. 5620 104	
5. PROGRAM TITLE DELTA IMP				8. ITEM NO.		9. TEST CODE	
10. TYPE OF LAUNCH PAD/PLATFORM Stationary				11. SIZE OF LAUNCH PAD/PLATFORM 92'-7"x50'-0"x22'-9"		6. PROGRAM NO. 2509	
12. LOCATION OF LAUNCH PAD/PLATFORM 17A 17B* Latitude-28°26'48.7673" 28°26'43.812 Longitude-80°33'54.6189" 80°33'57.177				13. SIMULATOR A. TYPE B. RA/SA		7. REVISION NO.	
14. DESCRIPTION OF LAUNCH PAD OR PLATFORM X Coordinate - 639,700/26 639,502.49 Y Coordinate - 1,445,405.72 1,495,365.52				22. DESCRIPTION OF LAUNCH OPERATIONS <u>F-Day</u> <u>Operation</u> 19 1st Stage Erection 19-17 1st Stage Quick Looks (Hyd, Engine, Elec) 17-14 1st Stage Propulsion Leak Checks 16-15 2nd Stage Erection 14 LOX Leak Checks 13 2nd Stage Quick Looks 11-9 1st and 2nd Stage Electrical Checks 8 Install, Inspect Grain, Solid Motors 6-5 2nd Stage Propulsion Checks 6 Acceptance and RF Test 3 Erection & Chk 3rd Stage, Payload; Integ Sys Chk 3 Facility Checkout, Ordnance Installation 1 S&A Checkout, Fuel Recirculation 0 Launch			
15. TYPE OF LAUNCHER Wet		16. SIZE OF LAUNCHER 22' Dia. x 5'		17. LAUNCHER WEIGHT Unknown		18. RA/SA GFE	
19. LAUNCHER AZIMUTH				20. LAUNCHER ELEVATION			
A. ATTITUDE 115°00'00"				A. ATTITUDE Above mean sea level (17A)33.64' (17B)33.662'			
B. POSITION ACCURACY DESIRED 17A-90°01'27" 17B-90°00'00"				B. POSITION ACCURACY DESIRED			
C. POSITION ACCURACY REQUIRED				C. POSITION ACCURACY REQUIRED			
21. DESCRIPTION OF LAUNCHER The launcher is a permanent type launcher with a fixed umbilical tower. The tower surrounds the vehicle during prelaunch testing and is movable and self-propelled. The vehicle is supported on six legs, five permanent and one retractable. The legs contain screws to hold down the vehicle prior to launch. The deck plating surrounding the legs is retracted for launch to expose the deflector plate, directing exhaust eastward.							
23. DESCRIPTION OF POSITIONING METHODS AND EQUIPMENT The vehicle is oriented on the launcher for a 115° azimuth. Retractable fuel and LOX masts are mounted on the launcher. The service tower, in the retired position and using the main hoist, raises the first and second stages off the transporters and lowers the stages to the launcher. The same procedure is followed using three alternate tower hoists in installing the solid engines. The third stage and S/C are erected by an alternate hoist with the tower around the vehicle. *Based on RCA Systems Analysis Monthly Accuracy Bulletin 17 dated 28 February 1966.							

FORM R 513
JULY 70

1. CLASSIFICATION

1. CLASSIFICATION _____

(PAGE TITLE) OTHER SUPPORT				2. REPLACES PAGE (S)		3. PAGE NO. 6000 105		
				DATED		4. DATE 10 June 1972		
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.		
8. ITEM NO.	9. TEST CODE	10. TYPE ITEM/SERVICE (POWER)	11. RA OR SA	12. DATES, AMOUNTS, OR CHECK FOR REQUIRED ITEM/SERVICE				13. PURPOSE AND REMARKS/SPECIAL INSTRUCTIONS
				FROM TO	FROM TO	FROM TO	FROM TO	
1	G	Facility Critical Power	SA	S-2 hr until test + 1 hr.		completion		500 kVA, 120/208 V, 3-phase, 60-cycle critical power is required at Cx 17 as the primary power source for all scheduled ground tests (except F-1 Day).
2	G	Facility Critical Power	SA	S-3 hr on F-1 Day launch.		until F-0 Day Defueling + 1 hr.		Same power requirement as item 1 for the primary instrumentation power source.
3	A	Portable Generator and Operator	SA	1 hr prior to start of countdown on F-1 Day until test completion.				100-kW portable generator at NW corner, Bldg AE, IMP Tlm Trailer.
4	A	Portable Generator	SA	Spacecraft erection thru launch.				150 kW, 480 V, 3-phase, 60-cycle (Hokansen backup) generator is required at Cx 17 for shroud air conditioning. Locate next to 400 Hz bldg adjacent to SW side BH 17 (west side of 5-1270 O.T.).
5	A	Critical Power Tolerances	SA					The tolerance for critical power at Cx 17 is: Voltage: 115 ± 5 V Frequency: 60 Hz ± 5% Dropouts: No greater than 100 ms

FORM R 503
JULY 70

1. CLASSIFICATION _____

1. CLASSIFICATION

(PAGE TITLE) OTHER SUPPORT				2. REPLACES PAGE (S)		3. PAGE NO. 8000.1 106		
				DATED		4. DATE 10 June 1972		
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.		
8. ITEM NO.	9. TEST CODE	10. TYPE ITEM/SERVICE (OTHER)	11. RA OR SA	12. DATES, AMOUNTS, OR CHECK FOR REQUIRED ITEM/SERVICE				13. PURPOSE AND REMARKS/SPECIAL INSTRUCTIONS
				FROM TO	FROM TO	FROM TO	FROM TO	
1	A	Mosquito Spray	SA					As required.
2	A	Maintenance	SA					As required.
3	A	Standards Laboratory	SA					As required - Physical Standards and PMEL/E.
4	A	Technical Library	SA					As required.
5	A	Vehicle Maintenance	SA					Routine maintenance - lube contractor vehicles.
6	A	Propellant Disposal	SA					As required - skim ponds after launch.
7	A	Aircraft Support	SA					As required - off and onload cargo.
8	A	Range Tabulating	SA					As required.
9	A	TOPS System	SA	F-2 Days				Complete operational check of the MOPS system in the BH, pad area, and mission peculiar industrial area as noted in TOPS pages. To be NIB to any tests in progress. Pad checks to be cleared thru Test Conductor.
10	A G	Preventive Maintenance	SA					For 2-ton bridge crane in Spin Test Bldg.
11	A	Protective Clothing	SA	30 days prior to launch (total time 1 week during this 30-day period)				Peroxide protective clothing required
12	A	Material Handling	SA					As required for packing and crating.

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1. CLASSIFICATION

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(PAGE TITLE) OTHER SUPPORT				2. REPLACES PAGE (S)		3. PAGE NO. 6000.2 107		
				DATED		4. DATE 10 June 1972		
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.		
8. ITEM NO.	9. TEST CODE	10. TYPE ITEM/SERVICE (OTHER)	11. RA OR SA	12. DATES, AMOUNTS, OR CHECK FOR REQUIRED ITEM/SERVICE				13. PURPOSE AND REMARKS/SPECIAL INSTRUCTIONS
				FROM TO	FROM TO	FROM TO	FROM TO	
13	A	Janitorial	SA	Four weeks prior to and thru launch.				Required for special cleanup of S/C levels of Pads 17A or B. Initial service is on request; high quality cleaning support required. Coordination thru NASA Pad 17 Superintendent is required. Clean room trained janitors required. Support required for Delta facilities on a normal basis.
14	A G	Air Conditioning	SA	From Stage 3 and S/C erection to launch.				Required for Cx 17 S/C enclosure (greenhouse) for environmental control.
15	A	Reproduction of Material	SA					As required - special requirements.
16	A	Base Shop	SA					As required to supplement MDAC facilities.
17	A9	Ordnance Storage, General	SA					Ordnance storage services as required. Storage services are required for apogee motors. Relative humidity is not to exceed 65%.
18	A G	Searchlights & Operators	SA	For night tests and vehicle launch illumination.				Generators, searchlights, and operators required at Cx 17 for night tests and for vehicle illumination during launch. Remote control of searchlights is desired. Same lighting conditions on vehicle requirement as launch illumination for photo.

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1. CLASSIFICATION

(PAGE TITLE) OTHER SUPPORT				2. REPLACES PAGE (S)		3. PAGE NO. 6000.3 108		
				DATED		4. DATE 10 June 72		
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.		
8. ITEM NO.	9. TEST CODE	10. TYPE ITEM/SERVICE	11. RA OR SA	12. DATES, AMOUNTS, OR CHECK FOR REQUIRED ITEM/SERVICE				13. PURPOSE AND REMARKS/SPECIAL INSTRUCTIONS
				FROM TO	FROM TO	FROM TO	FROM TO	
19	A	Storage (General Ordance)	SA					Storage area for Delta vehicle ordance devices is required. When these ordance devices require testing, the approved AFETR testing facility (Ordance Test Shed) will be made available.
20	A	TE-364-4 Solid Propellant Motors, Receiving, Inspection & Storage	SA	Continuous				Storage of up to six TE-364 solid propellant motors in an approved igloo or magazine-type structure is required. Storage temperatures must be maintained between +40°F to +100°F. Dimensions of the cylindrical motor container are 81 inches high and 76-1/2 inches in diameter. Radiographic inspection is REQD (25 Men Betatron).
21		Open Item						
22	A	Aircraft, Surveillance Clearance	SA	L-3 Days	until launch			Prevent overflights of Cx 17. Notify Cx 17 operations of other overflights (853-7711).
23		Open Item						
24	A	Apogee Motors	SA					Radiographic inspection required in accordance with MIL-STD-453. Using the 10 Mev Linac or 25 Betatron, six exposures are required of the bilaterals.

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1. CLASSIFICATION

1. CLASSIFICATION _____

(PAGE TITLE) OTHER SUPPORT				2. REPLACES PAGE (S)		3. PAGE NO. 6000.4 109		
				DATED		4. DATE 10 June 72		
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.		
8. ITEM NO.	9. TEST CODE	10. TYPE ITEM/SERVICE	11. RA OR SA	12. DATES, AMOUNTS, CR CHECK FOR REQUIRED ITEM/SERVICE				13. PURPOSE AND REMARKS/SPECIAL INSTRUCTIONS
				FROM TO	FROM TO	FROM TO	FROM TO	
25	A	TAD Solid Propellant Motors, Storage	SA					<p>sidewall tangents including forward and aft domes in 30 degree increments using 7 x 7 inch B film at two levels. Two thru-body exposures at 0 and 90 degrees are required, concurrent with the tangents.</p> <p>Continuous storage of seven TX-354 solid propellant motors and seven pyrogen units in an approved igloo or magazine-type structure is required. Motors to be in shipping containers or in built-up condition on handling dollies with solid propellants receiving area is necessary to unload motors from shipping containers onto handling dollies. Storage temperature must be maintained between +30° to 100°F for the TX-354. Dimensions of the motor on the handling dolly are 27ft, 7 in. long; 5 ft, 9 in. high; and 8 ft wide for both motors. Containerized motor dimensions are 22 ft long; 6 ft high; and 4 ft, 6 in. wide.</p>

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1. CLASSIFICATION _____

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(PAGE TITLE) OTHER SUPPORT				2. REPLACES PAGE (S)		3. PAGE NO. 6000.5 110		
				DATED		4. DATE 10 June 1972		
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.		
8. ITEM NO.	9. TEST CODE	10. TYPE ITEM/SERVICE (FOOD SERVICE)	11. RA OR SA	12. DATES, AMOUNTS, OR CHECK FOR REQUIRED ITEM/SERVICE				13. PURPOSE AND REMARKS/SPECIAL INSTRUCTIONS
				FROM TO	FROM TO	FROM TO	FROM TO	
1		Food Service (Complex 17)	SA	Daily, 11:30 AM	to 12:00 AM	Mon-day thru Friday.		Required to feed approximately 75-100 persons.
2		Food Service (Spin Test Bldg)	SA	Daily, 11:00 AM	to 11:20 AM	Monday thru Friday.		
3	A	Food Service (Complex 17)	SA	Continuous from start of RU count-down until area is cleared on F-1 and F-0 Days.* After final tower clearance, the mobile canteen is required at the fallback area through launch or until the pad is opened for normal work. It is also required for defueling.				
				*Critical times during the continuous period on F-1 and F-0 Days at Pad 17 are: at T-830 min on F-1 day at T-355 min on F-0 day at F-130 min on F-0 day				

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(PAGE TITLE) OTHER SUPPORT					2. REPLACES PAGE (S) DATED		3. PAGE NO. 6000.6 111 4. DATE 10 June 1972	
5. PROGRAM TITLE DELTA IMP					6. PROGRAM NO. 2509		7. REVISION NO.	
3. ITEM NO.	9. TEST CODE	10. TYPE ITEM/SERVICE (PUMPHOUSES)	11. RA OR SA	12. DATES, AMOUNTS, OR CHECK FOR REQUIRED ITEM/SERVICE				13. PURPOSE AND REMARKS/SPECIAL INSTRUCTIONS
				FROM TO	FROM TO	FROM TO	FROM TO	
1	A	Water Pressure	SA	Launch	Countdown			Pumphouse No. 1 will maintain water pressure at 125 psi until released after launch. <i>RELEASER, NOTED JUNE 11</i>

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1. CLASSIFICATION _____

1. CLASSIFICATION _____

(PAGE TITLE) OTHER SUPPORT				2. REPLACES PAGE (S)		3. PAGE NO. 0000.7 112		
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		4. DATE 10 June 1972 7. REVISION NO.		
3. ITEM NO.	9. TEST CODE	10. TYPE ITEM/SERVICE (SURVEY)	11. RA OR SA	12. DATES, AMOUNTS, OR CHECK FOR REQUIRED ITEM/SERVICE				13. PURPOSE AND REMARKS/SPECIAL INSTRUCTIONS
				FROM TO	FROM TO	FROM TO	FROM TO	
1		Launch Surveys	SA	5 working days prior to desired completion date.				Pan Am Range Support will arrange survey as required. One instrument operator with two theodolites and a Zeiss level is required (on-call basis) at Cx 17. Operator and instruments will be required if test is repeated. All instruments to be calibrated.
2	A,G	Theodolites	SA	F-9 to F-1 Days				

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1. CLASSIFICATION _____

1. CLASSIFICATION _____

(PAGE TITLE) OTHER SUPPORT					2. REPLACES PAGE (6)		3. PAGE NO. 6000.8 113	
					DATED		4. DATE 10 June 1972	
5. PROGRAM TITLE DELTA IMP					6. PROGRAM NO. 2509		7. REVISION NO.	
8. ITEM NO.	9. TEST CODE	10. TYPE ITEM/SERVICE (GUARDS & SECURITY)	11. RA OR SA	12. DATES, AMOUNTS, OR CHECK FOR REQUIRED ITEM/SERVICE				13. PURPOSE AND REMARKS/SPECIAL INSTRUCTIONS
				FROM TO	FROM TO	FROM TO	FROM TO	
1	A	Guards	SA	Continuous and during countdown on F-1 Day and launch.				Man stations as requested at Complex 17 and hangar areas to safeguard classified materials and vehicles.
2	A	Guards	SA	Continuous for new Delta Spin Test Facility two shifts/day starting 7:18 AM EST.				Maintenance of badge exchange system required.
3	A	Guards	SA	Two shifts/day starting 7:18AM EST.				Temporary use of Minuteman Mark VI Bldg requires support for Delta IMP. JFKSC/IS-SEC will issue orders specifying time.

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1. CLASSIFICATION _____

(PAGE TITLE) OTHER SUPPORT				2. REPLACES PAGE (S)		3. PAGE NO. 6000.9 114		
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.		
8. ITEM NO.	9. TEST CODE	10. TYPE ITEM/SERVICE (PAD SERVICES & ENGINEERING)	11. RA OR SA	12. DATES, AMOUNTS, OR CHECK FOR REQUIRED ITEM/SERVICE				13. PURPOSE AND REMARKS/SPECIAL INSTRUCTIONS
				FROM TO	FROM TO	FROM TO	FROM TO	
1	A	Facilities Checks and Preventive Maintenance	SA	L-2 and	L-1 Days			Checks required to ensure the service tower, water system, 60 and 400-cycle power systems are operational. Pad engineer will ensure that samples of RJ-1, liquid oxygen, and high pressure gases are taken thru the missile system at times of fueling, liquid oxygen fill, and F-1 day. One copy of sampling results to be mailed to NASA-ULO (DL-MLV-3). Critical spare parts should be on hand prior to countdown.
2	A	Air Conditioning Monitor	SA	From S/C erection	thru launch.			Monitor required at Cx 17B greenhouse air conditioner 24 hr/day. A temperature of 70°F ± 5°F and a humidity of 60% maximum must be maintained for experiment survival. Monitoring will be performed at least once every hour. It is requested that a log be established and maintained indicating inspection time, nature of system, corrective action if required, etc. Retain log at guard gate or with pad services.

1. CLASSIFICATION

(PAGE TITLE) OTHER SUPPORT				1. REPLACES PAGE (S)		3. PAGE NO. 6000.10 115		
				DATED		4. DATE 10 June 1972		
5. PROGRAM TITLE DELTA IMP				6. PROGRAM NO. 2509		7. REVISION NO.		
8. ITEM NO.	9. TEST CODE	10. TYPE ITEM/SERVICE (FIRE PROTECTION)	11. RA OR SA	12. DATES, AMOUNTS, OR CHECK FOR REQUIRED ITEM/SERVICE				13. PURPOSE AND REMARKS/SPECIAL INSTRUCTIONS
				FROM TO	FROM TO	FROM TO	FROM TO	
1	A	Firex System	SA	F-1 Day and launch. Start of countdown thru test determination or defueling.				Required at Complex 17. Pre-operation servicing of the launch stand Firex System is required. Water flow at 125 pounds pressure must be available to permit activation of fire protection system.

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1. CLASSIFICATION